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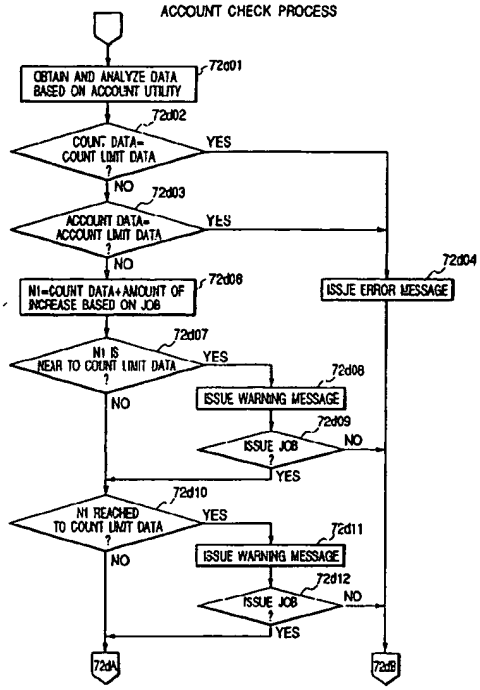
(54) Peripheral apparatus, control method therefor and storage medium

(57) A job not executabl becaus of an account limit is rejected before it is transmitted so that ther is no job which is transmitted but discarded without being executed at a peripheral device because of the account limit. Prior to issuing a job, account

EP 1 004 971 A2

information recorded in a peripheral device is acquired to judge wh ther the job to be issued is in excess of th account limit. If in excess of th account limit, th job is not transmitted and cancelled by displaying an error messag to a client.

FIG. 93



Description

BACKGROUND OF THE INVENTION

Field of the Invention

[0001] The present invention relates to a peripheral apparatus such as a printer, scanner, copy machine and facsimile having an account function, to its control method and to a storage medium for realizing such a method.

Related Background Art

[0002] In a conventional peripheral apparatus and its account system, after a client issues a job, an account is calculated at the peripheral apparatus in accordance with the received job.

[0003] Conventional techniques do not check account information recorded in a peripheral apparatus before a job is issued from a client. It is therefore impossible to check whether the job to be issued is in excess of an account limit. As a result, although the job is issued, it may be discarded without being executed. In such a case, an operation of generating and transmitting a job packet at the client becomes wasteful. Also, unnecessary load is applied to the network.

[0004] In a conventional peripheral apparatus and its account system, an accounting method for a job is not explicitly indicated and an account calculation only relative to a user ID is performed.

[0005] Therefore, it is not possible to select an account object to be charged for each job issued by a user, or to charge each group of users. It is also impossible to automatically charge a predetermined object or charge an optionally designated object.

[0006] A conventional printer is not provided with means for confirming whether a job can be executed without fail before it is issued. Therefore, unless a job is actually issued, whether or not the job is executed without fail cannot be confirmed.

[0007] The problem that execution of a job without fail cannot be ensured at the time when a job is issued and the problem that the status of each peripheral apparatus cannot be known, may increase wasteful network traffics. If a user has no access privilege, a job execution cannot be permitted.

SUMMARY OF THE INVENTION

[0008] In order to solve the above problems, the invention provides a peripheral apparatus for making each function means execute a job in response to a job request from a client, comprising: means for storing an account limit value of the client; means for judging whether an account value corresponding to the job request from the client reaches the account limit value; and means for regulating a transmission of the job by the client in accordance with a judgement result by the judging means.

[0009] Another embodiment of the invention provides a peripheral apparatus comprising: setting means for setting an account identification code corresponding to each of a plurality of user identification codes; detecting means for analyzing a user identification code added to a transmitted job and detecting a corresponding account code; and accounting means for charging a client corresponding to the account identification code for the job.

[0010] Another embodiment of the invention provides a peripheral apparatus capable of registering, storing and deleting a plurality of user identification codes and account identification codes and account counters corresponding to the user identification codes and the account identification codes, comprising: means for registering, storing and deleting a relation of user IDs belonging to each account identification code; means for analyzing the user ID added to a transmitted job; and accounting means for executing a charging operation relative to a counter corresponding to the account ID to which the user ID added to the job belongs.

[0011] Another embodiment of the invention provides a peripheral apparatus capable of registering, storing and deleting a plurality of account IDs and corresponding account counters, comprising: means for analyzing a user ID and an account ID added to a transmitted job; means for determining which of the user ID and the account ID is charged; and means for charging the account counter corresponding to the determined user ID or the determined account ID.

[0012] Another embodiment of the invention provides a peripheral apparatus connected via a network to an information apparatus, wherein the peripheral apparatus comprises control means for controlling a plurality of function means and accounting means for charging for a use of the function means; and the charging means charges for a user and/or a client identified by a user identification code and/or an account identification code supplied from the information processing apparatus.

[0013] Another embodiment of the invention provides a peripheral apparatus system including an information processing apparatus and a peripheral apparatus having a plurality of functions and conn cted via a network to the information processing apparatus, wherein the peripheral apparatus compris s: m ans for discriminating between a user

identification code and an account identification code; and means for charging for a us of the function in accordanc with the discriminated identification cod .

[0014] Another embodiment of the inv ntion provides a method of controlling a peripheral apparatus capabl of registering, storing and deleting a plurality of us r identification cod s and account identification codes and account counters corresponding to the user identification codes and the account identification codes, comprising the steps of: analyzing the user ID added to a transmitted job; and executing a charging operation relative to a counter corresponding to the account ID to which the user ID added to the job belongs.

[0015] Another embodiment of the invention provides a computer readable storage medium storing a control program for a peripheral apparatus capable of registering, storing and deleting a plurality of user identification codes and account identification codes and account counters corresponding to the user identification codes and the account identification codes, the control program comprising the steps of: analyzing the user ID added to a transmitted job; and executing a charging operation relative to a counter corresponding to the account ID to which the user ID added to the job belongs.

[0016] Another embodiment of the invention provides an accounting apparatus comprising: setting means for setting a relation between a user identification code, an account identification code and a service identification code; and charging means for charging an account counter corresponding to one of the identification codes for a job.

[0017] Other objects and features of the present invention will become more apparent from the following detailed description of the embodiment when read in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0018] Fig. 1 is a diagram showing the structure of a multi-function peripheral apparatus (MFP) according to an embodiment of the invention.

[0019] Fig. 2 is a diagram showing the system structure according to an embodiment of the invention.

[0020] Fig. 3 is a diagram showing the hardware structure of a controller of MFP shown in Fig. 1.

[0021] Fig. 4 is a diagram showing the software structure of a controller of MFP shown in Fig. 1.

[0022] Fig. 5 is a diagram showing the software structure of a controller of MFP shown in Fig. 1.

[0023] Fig. 6 is a diagram showing the software structure of a controller of MFP shown in Fig. 1.

[0024] Fig. 7 is an attribute table of a supervisor 410 shown in Fig. 4.

[0025] Fig. 8 is a diagram explaining the meanings of an attribute ID and a type ID of the attribute table shown in Fig. 7.

[0026] Fig. 9 is a sub address - service ID corresponding table.

[0027] Fig. 10 is a diagram explaining the meanings of a connection type ID shown in Fig. 9.

[0028] Fig. 11 is a sub address - task type corresponding table.

[0029] Fig. 12 is a diagram explaining the meanings of a task type ID shown in Fig. 11.

[0030] Fig. 13 is a user certification table.

[0031] Fig. 14 is an access control table.

[0032] Fig. 15 is a diagram explaining a security level.

[0033] Fig. 16 is an event set table.

[0034] Fig. 17 is an event format table.

[0035] Fig. 18 is an attribute table of a print manager.

[0036] Fig. 19 is a diagram explaining the meanings of an attribute ID and a type ID in the attribute table shown in Fig. 18.

[0037] Fig. 20 is a job table.

[0038] Fig. 21 is a job request table.

[0039] Fig. 22 is an attribute table of a scan job manager.

[0040] Fig. 23 is a diagram explaining the meanings of an attribute ID and a type ID in the attribute table shown in Fig. 22.

[0041] Fig. 24 is an attribute table of a copy job manager.

[0042] Fig. 25 is a diagram explaining the meanings of an attribute ID and a type ID in the attribute table shown in Fig. 24.

[0043] Fig. 26 is an attribute table of a font manager.

[0044] Fig. 27 is a diagram explaining the meanings of an attribute ID and a type ID in the attribute table shown in Fig. 26.

[0045] Fig. 28 is a font table.

[0046] Fig. 29 is an attribute table of a form overlay manager.

[0047] Fig. 30 is a diagram explaining the meanings of an attribute ID and a type ID in the attribute table shown in Fig. 29.

[0048] Fig. 31 is a form overlay table.
[0049] Fig. 32 is an attribut table of a log manager.
[0050] Fig. 33 is a diagram explaining the meanings of an attribute ID and a type ID in th attribute tabl shown in Fig. 32.
[0051] Fig. 34 is a log table.
[0052] Fig. 35 is a diagram explaining the contents of log data.
[0053] Fig. 36 is a log format table.
[0054] Fig. 37 is an attribute table of a color profile manager.
[0055] Fig. 38 is a diagram explaining the meanings of an attribute ID and a type ID in the attribute table shown in Fig. 37.
[0056] Fig. 39 is a color profile table.
[0057] Fig. 40 is an attribute table of a printer controller.
[0058] Fig. 41 is a diagram explaining the meanings of an attribute ID and a type ID in the attribute table shown in Fig. 40.
[0059] Fig. 42 is a job queue table.
[0060] Fig. 43 is a diagram explaining the meanings of statuses shown in Fig. 42.
[0061] Fig. 44 is an attribute table of a scanner controller.
[0062] Fig. 45 is a diagram explaining the meanings of an attribute ID and a type ID in the attribute table shown in Fig. 44.
[0063] Fig. 46 shows the format of a command packet.
[0064] Fig. 47 is a flow chart illustrating a command packet process.
[0065] Fig. 48 is a flow chart illustrating an attribute table access process.
[0066] Fig. 49 is a flow chart illustrating a service ID list inquiry process.
[0067] Fig. 50 is a flow chart illustrating a service address inquiry process.
[0068] Fig. 51 is a flow chart illustrating a process of inquiring a service ID by designating a task type.
[0069] Fig. 52 is a diagram illustrating certification of a service ID, a user ID and a PWD.
[0070] Fig. 53 is a diagram showing the structure of jobs.
[0071] Fig. 54 is a diagram showing the structure of documents.
[0072] Fig. 55 is a diagram showing the structure of binders.
[0073] Fig. 56 is a flow chart illustrating a job script process to be executed by each manager.
[0074] Fig. 57 is a diagram illustrating a job script process to be executed by a manager.
[0075] Fig. 58 is a diagram illustrating a job script process to be executed by a manager.
[0076] Fig. 59 is a diagram illustrating a job script process to be executed by a manager.
[0077] Fig. 60 is a diagram illustrating a job script process to be executed by a manager.
[0078] Fig. 61 is a diagram illustrating a job script process to be executed by a manager.
[0079] Fig. 62 is a document table.
[0080] Fig. 63 is a binder table.
[0081] Fig. 64 is a flow chart illustrating a job process to be executed by a print job manager.
[0082] Fig. 65 is a flow chart illustrating a job event handler process.
[0083] Fig. 66 is a flow chart illustrating a data reception - PDL rasterizer process.
[0084] Fig. 67 is a flow chart illustrating a printer controller process.
[0085] Fig. 68 is a flow chart illustrating an account process.
[0086] Fig. 69 is a flow chart illustrating a job process to be executed by a scan job manager.
[0087] Fig. 70 is a flow chart illustrating a scanner controller process.
[0088] Fig. 71 is a flow chart illustrating a scanner controller internal process.
[0089] Fig. 72 is a flow chart illustrating a data transmission process.
[0090] Fig. 73 is a flow chart illustrating a job process in a copy job manager.
[0091] Fig. 74 is a flow chart illustrating a job process (download) to be executed by a font manager, a form overlay manager, a log manager, and a color profile manager.
[0092] Fig. 75 is a flow chart illustrating a job process (upload) to be executed by a font manager, a form overlay manager, a log manager, and a color profile manager.
[0093] Fig. 76 is a flow chart illustrating a job management at each manager.
[0094] Fig. 77 is a flow chart illustrating an event transmission process.
[0095] Fig. 78 is a flow chart illustrating a process of transmitting data (script) from a device.
[0096] Fig. 79 is a diagram showing the hardware structure of a client PC.
[0097] Fig. 80 is a diagram showing the software (control program) structur of a cli nt PC.
[0098] Fig. 81 is a flow chart illustrating a pack t generation/transmission process.

[0099] Fig. 82 is a flow chart illustrating a process of acquiring information at a client sid and automatically configuring software (control program).

[0100] Fig. 83 is a flow chart illustrating a process of issuing a job by designating a task type.

[0101] Fig. 84 is a diagram showing the structure of an event.

[0102] Fig. 85 is a flow chart illustrating an event transmission process.

[0103] Fig. 86 is a flow chart illustrating a log process.

[0104] Fig. 87 is a flow chart illustrating a process of acquiring and processing account information.

[0105] Fig. 88 is a flow chart illustrating a process of issuing a job (print job, data download).

[0106] Fig. 89 is a flow chart illustrating a device information check process.

[0107] Fig. 90 is a diagram illustrating a status check process before job issue.

[0108] Fig. 91 is a flow chart illustrating a job process with a user management function.

[0109] Fig. 92 is a flow chart illustrating a data transmission method determining process.

[0110] Fig. 93 is a diagram illustrating an account check process.

[0111] Fig. 94 is a diagram illustrating an account check process.

[0112] Fig. 95 is a diagram showing an error message.

[0113] Fig. 96 is a diagram showing an error message.

[0114] Fig. 97 is a diagram showing an error message.

[0115] Fig. 98 is a diagram showing an error message.

[0116] Fig. 99 is a diagram showing an error message.

[0117] Fig. 100 is a diagram showing an error message.

[0118] Fig. 101 is a flow chart illustrating a process of issuing a job (scan job, data upload).

[0119] Fig. 102 is a flow chart illustrating a data type determining process.

[0120] Fig. 103 is a flow chart illustrating a data reception method determining process.

[0121] Fig. 104 is a flow chart illustrating a data reception process.

[0122] Fig. 105 is a flow chart illustrating a copy job issue process.

[0123] Fig. 106 is a flow chart illustrating a job management command issue process.

[0124] Fig. 107 is a memory map of a disk 315 of MFP.

[0125] Fig. 108 is a memory map of a disk 6009 of a client PC.

[0126] Fig. 109 is a diagram showing the structure of a client PC.

[0127] Fig. 110 is a diagram showing an LBP applicable to a laser beam printer of MFP.

[0128] Fig. 111 is a diagram showing an IJRA applicable to an ink jet printer of MFP.

[0129] Fig. 112 is a diagram showing an example of a screen displayed on a display.

[0130] Fig. 113 is a diagram showing an example of a screen displayed on a display.

[0131] Fig. 114 is an account ID table.

[0132] Fig. 115 is a current count data table.

[0133] Fig. 116 is a count data format table.

[0134] Fig. 117 is a count limit data table.

[0135] Fig. 118 is a count unit price data table.

[0136] Fig. 119 is a current account data table.

[0137] Fig. 120 is an account limit data table.

[0138] Fig. 121 is a diagram showing the structure of a two-layer job script.

[0139] Fig. 122 is a diagram showing the structure of a three-layer job script.

[0140] Fig. 123 is a diagram showing the structure of a scan job script.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0141] Fig. 1 is a diagram showing the structure of a multi-function peripheral (MFP) according to an embodiment of the invention.

[0142] The multi-function peripheral (MFP) is connected to various types of network devices to be described below, and collectively manages and controls respective devices in response to an instruction supplied from a client via a network. In Fig. 1, reference numeral 101 represents a controller for controlling MFP. This controller 101 is constituted of a hardware structure shown in Fig. 3 and a software structure (control/management programs) such as a program shown in Fig. 106 which is stored in a disk 315 shown in Fig. 3. In accordance such programs, the controller 101 controls and manag s the network devices. Referenc numeral 102 represents a scanner engin which is controlled by the controller 101. Referenc numerals 103 and 104 represent laser printer engin s (LBP) 1, 2 which are controlled by the controller 101. Th las r print r engine 1 indicated at reference numeral 103 is connected to a finisher 106 which can collect a plurality of recording materials (such as paper) output from the printer ngine and staple them. The finisher

106 is also controlled by th controller 101.

Referenc numeral 105 represents an ink jet printer engine (IJP) which can print out a color print and is controlled by the controller 101. Referenc numeral 107 represents a network (Ethern t) interface which provides the controller 101 with bidirectional communications. Reference numeral 108 represents an IEEE 1394 interfac which provides the controller 101 with bidirectional communications. Referenc numeral 109 represents an IEEE 1284 interface which provides the controller 101 with bidirectional communications. Reference numeral 110 represents a user interface which is constituted of an LCD display and a keyboard which are used to display information supplied from the controller 101 and transfers a user instruction to the controller 101.

[0143] MFP constructed as above manages and controls the devices including three physical printers LBP (B/W, with finisher) 103, LBP (B/W) 104 and IJP (color) 105. MFP can issue a print job selectively to these physical printers. MFP can also control four logical printers (cluster printers) by reconfiguring these physical printers, the logical printers including LBP 103 + LBP 104, LBP 104 + IJP 105, LBP 103 + IJP 105, and LBP 103 + LBP 104 + IJP 105. Similar to the physical printers, MFP can issue a print job selectively to these logical printers. IJP may be reconfigured to a logical printer capable of printing out only a B/W print and MFP can also issue a print job to this logical printer. These seven printers, LBP 103, LBP 04, IJP 105, LBP 103 + LBP 104, LBP 104 + IJP 105, LBP 103 + IJP 105, and LBP 103 + LBP 104 + IJP 105 can be automatically selected in response to a print job instructed by a client and the print job is executed by using optimum printers.

[0144] A color original can be read with a scanner in response to a scan job issued from a client. A copy job can be issued by selecting (or automatically selecting) the scanner and the eight printers LBP 103, LBP 04, IJP 105, LBP 103 + LBP 104, LBP 104 + IJP 105, LBP 103 + IJP 105, LBP 103 + LBP 104 + IJP 105, and IJP capable of only a B/W printer. If the printer is only IJP, a color copy job can also be issued.

[0145] Fonts and form overlays prepared in advance can be used in a print job. These fonts and form overlays can be uploaded and downloaded between devices or to and from an external client or the like, to manage these resources. Color profiles can be used in a print job, a scan job and a copy job and manages as resources. A log can be automatically generated each device and uploaded.

[0146] Networks such as Ethernet and TCP/IP and for IEEE 1284 and interfaces for IEEE 1284, IEEE 1394 and the like are prepared. External clients accessed via these interfaces can use all functions described above. Each interface has a correspondence between a sub address and physical/logical devices (printer, scanner, copier) and resources. A client designates a sub address and selects a physical/logical device and resource to realize a desired function. A job can be issue and a download/upload can be instructed relative each interface at the same time. Regarding the correspondence between the sub address and physical/logical devices and resources, MFP has an attribute table for managing the function and the like of each device connected thereto, and can access a similar attribute table possessed by each device. When an external client inquires MFP, information on the function or the like of each device connected to MFP can be acquired. In this manner, a plurality of devices can be managed collectively. A client can use the function via the internal user interface.

[0147] More specifically, as a client inquires via the user interface a supervisor of MFP to be later described, it is possible to acquire the outline serviceable functions (job types, resources and the like), a sub address used for a job issue and resource download/upload, and detailed function information (maximum copies, finisher type, supported PDL, usable output bins, and the like). By using the acquired information, a client may automatically configure software (control program). The sub address to be used for this inquiry is determined in advance between MFP and each client. An administrator of MFP limits each function in accordance with the connection type and user.

(Whole System Structure)

[0148] Fig. 2 is a diagram showing the system structure of this embodiment. MFP analyzes an instruction from a client connected each network to set up each function by using printers, scanners and the like. In Fig. 2, reference numeral 201 represents MFP shown in Fig. 1. MFP 201 is connected to client PCs (information processing apparatus) 202, 203, 204, 205 via a network interface cable (10 BASE-T), an IEEE 1394 interface cable 206 and an IEEE 1284 interface cable 207. As shown in Fig. 109, each client PC runs on various types of software (control program) stored in a disk 6009 as a storage medium shown in Fig. 108 to be described later. The client PCs 202 and 203 connected to an Ethernet cable 208 designates an IP address and a port number to connect MFP 201 and outputs IP packet data. The client PC 204 connected to the IEEE 1394 interface 206 designates a node ID and a logical unit number (LUN) to connect MFP 201 and output SBP-2 packet data. The client PC 205 connected to the IEEE 1284 interface 207 designates a socket number node ID to connect MFP 201 and output IEEE 1284.4 packet data.

(Hardwar Structure of MFP)

[0149] Fig. 3 is a diagram showing the hardware structure of the controller 101 of this embodiment shown in Fig. 1.

In th controller 101, a CPU 301 is connected via a bus 313 to a memory (RAM) 302, a user int rface (operation unit) 110 constituted of an LCD display 303 and a keyboard 304, a ROM 314 and a disk 315. Various programs for device management and data such as attribute tables stored in the disk (storag medium) 315 such as a hard disk and a floppy disk shown in Fig. 107 r aliz the above-d scrib d functions, and are sequentially writt n in th memory (RAM) 302 wh n necessary. The disk 315 may be a removable disk relative to MFP 201 or may be a disk built in MFP 201. Programs shown in Fig. 107 may be downloaded and stored in the disk 315 by the clients PCs 202, 203, 204 and 205 or another MFP via the network cable (10 BASE-T) 208, IEEE 1394 interface cable 206 and IEEE interface cable 207.

[0150] The disks 315 and 6009 store not only those programs definitely illustrated in Figures but also all programs explained in this specification.

[0151] The LCD display 303 and keyboard 304 constitute the user interface (operation unit) 110 shown in Fig. 1. CPU 301 operates to write data to the display 303 to display it, and to read data from the keyboard 304 to input a user instruction.

[0152] The bus 313 is connected to a network interface connector 305, an IEEE 1394 interface connector 306 and an IEEE 1284 interface connector 307 which correspond to the network interface 107, IEEE 1394 interface 108 and IEEE 1284 interface 109 shown in Fig. 1, respectively and which are connected to the Ethernet (10 BASE-T) cable 208, IEEE 1394 cable 206 and IEEE 1284 cable 207 shown in Fig. 2. CPU 301 reads/writes data via these interfaces to communicate with devices via the interfaces.

[0153] The bus 313 is also connected to a laser beam printer engine 308, a finisher 309, a scanner engine 310, a laser beam printer engine 311 and an ink jet printer engine 312 which correspond to the laser beam printer engine 103, finisher 106, scanner engine 102, laser beam printer engine 104 and ink jet printer engine 105. CPU 301 reads/writes data relative to these engines to control the operations of the printer engine, scanner engine and the like and acquire various states. The laser beam printer engine 308, finisher 309, scanner engine 310, laser beam printer engine 311 and ink jet printer engine 312 may not be provided in MFP 201 but may be discrete devices on the network which are controlled by the controller 101 of MFP 201. These engines have various sensors to check their engine states and the originals and recording sheets to be processed.

(Software Structure of Controller 101)

[0154] Fig. 4 shows the structure of software (management/control programs) stored in the disk 315 of the controller 101. The software (control programs) is executed by CPU 301. In Fig. 4, solid lines indicate a flow of data and control, and broken lines indicate settings and acquisition of functions. Reference numeral 401 represents a user interface driver which controls the LCD display 303 and keyboard 304.

Reference numeral 405 represents a user interface manager (control program) which analyzes an instruction input from the UI driver 401 by a user, generates a command packet shown in Fig. 46 and outputs it to an interpreter (control program) 409. The user interface manager 405 also analyzes a command packet input from the interpreter 409 and displays the results on the LCD display 303 via the UI driver (control program).

[0155] Reference numeral 402 represents a network interface driver (control program) which controls the network interface controller 305 to perform a physical layer (physical packet) process for a network packet, i.e., extract a transport packet from a physical packet or generate a physical packet from a transport packet. Reference numeral 406 represents a TCP/IP - UDP/IP process module which processes a transport packet output from a network interface 402 to extract a command packet and output it to the interpreter 409. This module 406 also generates a transport packet from a command packet output from the interpreter 409 and outputs it to the network interface 402.

[0156] Reference numeral 403 represents an IEEE 1284 driver (control program) which controls the IEEE 1284 interface 307. Reference numeral 407 represents an IEEE 1284.4 process module (control program). IEEE 1284.4 is the standards of a transport layer intended to be used mainly with an IEEE 1284 interface. The IEEE 1284.4 process module (control program) 407 processes a transport packet output from the IEEE 1284 driver 403 to extract a command packet and output it to the interpreter 409. This module 407 also generates a transport packet from a command packet output from the interpreter 409 and outputs it to the IEEE 1284 driver 403. Reference numeral 404 represents an IEEE 1394 driver (control program) which controls the IEEE 1394 interface 306.

[0157] Reference numeral 408 represents a module (control program) which processes an SBP -2 (serial bus protocol which is a transport layer of IEEE 1394. The SBP-2 process module 408 processes a transport packet output from the IEEE 1394 driver 404 to extract a command packet and output it to the interpreter 409. This module 1394 also generates a transport packet from a command packet output from the interpreter 409 and output it to the IEEE 1394 driver 404. The packet interpreter 409 analyzes a command packet input from each of the transport process units 406, 407 and 408 and from th user int rface manager 405 and generates a command. The packet interpreter 409 also generates a command packet upon request from other modul s (control program). In accordanc with a sub address - servic ID corresponding tabl (Fig. 9) possessed by a supervisor (chi f administrator) 410, the int rpreter 409 processes only the command packet input from an ffective sub address, and cancels or discards th command packet input from other sub address s.

[0158] The supervisor 410 supervises the operation of the controller by storing in th disk 315 various data shown in Fig. 7 (attribute table), Fig. 9 (sub address - service ID corr sponding table), Fig. 11 (service ID - task type corresponding table), Fig. 13 (user certification table), Fig. 14 (access control table), Fig. 16 (event set table), Fig. 17 (event format table), Fig. 114 (account ID table), and Fig. 115 (table of user ID changeabl to account ID). In accordance with an input command, the supervisor 410 refers to and change various data held by itself, each manager (font manger 413, form overlay manager 414, log manager 415, color profile manager 416, print managers 501 to 509, scan job manager 419, and copy job managers 601 to 608), and each controller (printer controllers 510 to 512 and scanner controller 420).

[0159] Reference numeral 411 represents a security gate which limits a command input so that only a user having a user right is allowed to access MFP 201 in accordance with the user certification table (Fig. 13) and access control table (Fig. 14). Reference numeral 412 represents a dispatcher (control program) dispatched a command input from the interpreter 409 to each resource manager (font manger 413, form overlay manager 414, log manager 415, color profile manager 416) and each job manager (print managers 501 to 509, scan job manager 419, and copy job managers 601 to 608). The font manager 413 manages fonts and stores in the disk 315 the data such as shown in Fig. 26 (attribute table) and Fig. 28 (font table). Fonts (stored in the disk 315 or ROM 314) managed by the font manager 413 are passed to PDL rasterizers 417 and 418 and used for a print job process.

[0160] The form overlay manager 414 manages form overlays. The form overlay manager 414 stores in the disk 315 the data shown in Fig. 29 (attribute table) and Fig. 31 (form table). Form overlays (stored in the disk 315 or ROM 314) managed by the form manager 414 are passed to the PDL rasterizers 417 and 418 and used for a print job process. The log manager 415 manages logs. The log manager 415 stores in the disk 315 the data shown in Fig. 32 (attribute table) and Fig. 34 (log table). A log is output from each manager and managed by the log manager. In this embodiment, a log file is stored in RAM 302 or disk 315 and updated each time when necessary.

[0161] The color profile manager 416 manages color profile data for the color matching by the color scanner and color printer. The color profile manager 416 stores in the disk 315 the data shown in Fig. 37 (attribute table) and Fig. 39 (color profile table). Color profiles managed by the color profile manager 416 are passed to each printer controller (control program) 510, 511, 512 and a scanner controller (control program) 420 and used for a print job process, a copy job process and a scan job process. The PDL (page descriptive language) rasterizer 417 processes document data written by PS (registered trademark) which is one kind of PDL, and outputs image data. The scan job manager 419 manages a scan job. The scan job manager 419 stores in the disk 315 the data shown in Fig. 22 (attribute table). The scan job manager 419 instructs the scan controller 420 to executes scanning.

Reference numeral 420 represents a scanner controller for controlling the scanner engine 310. The scanner controller 420 stores in the disk 315 the data shown in Fig. 44 (attribute table) representative of the function, state and performance of the scanner engine 310. Both the scan job manager 419 and scanner controller 420 have the data (Figs. 22 and 44) representative of the function and performance, and the data representative of the function is not necessarily required to be the same. The function can be limited by rewriting the data (Fig. 22) possessed by the scan job manager 419 via the supervisor 410.

[0162] The font manager 413, form overlay manager 414, log manager 415, and color profile manager 416 ar resource management programs. The scan job manager 419, print job managers 501 to 509 and copy job manager 601 to 608 are logical device (scanner, printer) control programs. A laser beam printer controller 510, the scanner controller 420 are physical device (printer, scanner) control programs.

(Structure of Print Job Manager)

[0163] Fig. 5 shows the details of the software (control program) structure shown in Fig. 4. Each print manager receives a command from the dispatcher 412, as will be later described. The dispatcher 412 shown in Fig. 5 is the same as that shown in Fig. 4 and dispatches a command packet to the print job managers (control program) 501 to 509 which manages a print job. Each print job manager stores the data such as shown in Fig. 18 (attribute table) in the disk 315 to always monitor its own function and the like. Each print job manager is assigned for its print job a predetermined printer controller (LBP controller 510, LBP controller 511, ink jet controller 512, controller 51, or an arbitrary combination of controllers 10 to 512) and a printer engine connected to the controller. This assignment of the printer controller (control program) is written in the data of an attribute ID 2001 shown in Fig. 18. However, only the print job manager 508 has a function of dynamically selecting a printer engine. This function is written in the data (attribute table) possessed by the print job manager 508. Each print manager stores in the disk 315 the data such as shown in Fig. 20 (job table) and Fig. 21 (job request table), which data indicates how the input print job is executed by which printer controller. Th printer controllers 510 to 512 control th printer engines 308, 311 and 312. Th printer controller 510 controls also the finisher 309. Each printer controller stores the data such as shown in Fig. 40 (attribute table) in the disk 315, th data indicating th function, state and performanc of th corresponding printer engin . Each controller stores in th disk 315 the data such as shown in Fig. 42 (job queue table) indicating the state

of an input job.

[0164] The print job managers 501 to 509 and printer controller 510 to 512 each stor in th disk 315 th data such as shown in Fig. 18 (attribute table) and Fig. 40 (attribut tabl), th data indicating the function and performance. Gen rally, the print job manager has the whole of performances and common p rformances poss ssed by th controllers used by the print job manager. However, a portion of these functions may be changed by changing the data (Fig. 18) possessed by the print job manager through the supervisor 410. For example, although the print job managers 503 and 509 use the same printer controller 512 and can provide the same function and performance, it can make the print job manager 503 to print out a color print and the print job manager 509 not to print out a color print, by a setting process for data possessed by the print manager, as will be later described.

(Structure of Copy Job Manager)

[0165] Fig. 6 is the details of the software (control program) structure shown in Figs. 4 and 5. A copy job manager to be described later also receives a command from the dispatcher 412. The dispatcher shown in Fig. 6 is the same as that shown in Fig. 4, and dispatches a command packet to copy job managers (control program) 601 to 608 which control a copy job. Each copy job manager stores the data such as shown in Fig. 24 (attribute table) in the disk 315. Each copy job manager is assigned for its copy job a predetermined printer controller and scanner controller and a printer engine and scanner engine connected thereto. This assignment of the printer controller and scanner controller is written in the data of an attribute ID 2001 shown in Fig. 28. However, only the print job manager 608 has a function of dynamically selecting a printer engine. This function is written in the data (attribute ID 2002) possessed by the coy job manager 608. Each copy manager stores in the disk 315 the data such as shown in Fig. 20 (job table) and Fig. 21 (job request table), which data indicates how the input copy job is executed by which printer controller and scanner controller. The printer controllers 510 to 512 control the printer engines which are the same as those shown in Fig. 5.

(Attribute Table of Supervisor)

[0166] Fig.7 shows the data (attribute table) which the supervisor (control program) 410 stores in the disk 315 and manages. This table provides the function outline, connection information, security information, account information (current account data, account limit data) to be described later, respectively of MFP 201. Each row of the table corresponds to an information unit (record), and the data is constituted of a collection of a plurality of records. Each record is constituted of an attribute ID 701, a type ID 702, and an attribute value 703. In accordance with this data, the setting status of a connected device, permission of execution of each command, and the like are judged. The attribute ID 701 represents the information type such as shown in Fig. 8. In accordance with this attribute ID 701, the meaning of the corresponding value 703 is defined. The attribute ID 701 is used in common for all devices. Devices having the same attribute ID share the same type of information. As shown in Fig. 8, the type ID 702 indicates what data type the value 703 has, and is used when the value 703 is interpreted. The type ID is determined solely by the attribute ID, and is defined uniquely in each device. In this embodiment, although the attribute table has both the attribute ID 701 and type ID 702, a corresponding table between the attribute ID and type ID may be stored as the data separately from the attribute table and only the attribute ID and value may be stored in the attribute table. The value 703 indicates an attribute value corresponding to the attribute ID 701.

[0167] Fig. 8 shows the details of the attribute ID 701 and type ID 702 of the attribute table shown in Fig. 7. An attribute ID 102 "supported security level list" is a list of settable security levels necessary for requesting an operation to the supervisor. The security levels are shown in an access control table shown in Fig. 14. An attribute ID 103 "current security level" indicates a security level currently set to the supervisor. An attribute ID 501 "supported event list" is a list of event IDs uniquely defined for each event type and capable of being notified to the supervisor. Setting an actual event transmission is performed by setting the connection type and destination of an event notice together with the event ID to an event set table shown in Fig. 16. The value "Table Data" of the attribute table shown in Fig. 7 indicates that the value is the data having the type format (52 to 104) of the type ID.

(Corresponding Table of Sub Address - Service ID (SID))

[0168] Fig. 9 is a corresponding table between a sub address and a service ID. This table is stored in the disk 315 as the attribute value of the attribute ID 1001 (sub address - SID corresponding table) of the attribute table shown in Fig. 7. The sub address - SID corresponding table indicates which service (e.g., printing and download of font) can be received when a command packet is issued to which sub address. In accordance with an effective flag or the like in this table, the interpreter 409 judges for each connection typ whether a job service is provided or not. In this table, each row corresponds to an information unit (record), and th data is constituted of a collection of a plurality of records. Each record has a connection typ ID 801, a sub address 802, a servic ID 803, an effectiv flag 804, an eff ctiv user list 805, and an invalid user list 806. The connection type ID 801 is an identifier representative of the connection

type. Fig. 10 is a diagram illustrating the meanings of ach connection type ID, in which 0 indicat s "Internal (user interface)", 1 indicates TCP/IP (network), 2 indicates IEEE 1284.4 (IEEE 1284), and 3 indicates SBP-2 (IEEE 1394).

[0169] The sub address 802 indicates a sub address for each connection typ . Although th user interface has no sub address, a sub address is assign d for the conveni nce sake. A command packet is s nt from the user interface by using this sub address information.

[0170] The service ID 803 is an identifier indicating the contents of service. The service ID 803 is assigned to each manager shown in Figs. 4 to 6 in one-to-on correspondence.

[0171] The effective flag 804 indicates whether the sub address is valid or not. If this value is true (YES), the sub address is effective and the user can issue a command packet to the sub address. If this value is false (NO), the sub address is invalid, and even if a command packet is issued to the sub address, it is cancelled. In the example shown in Fig. 8, service of the service ID 8 (print job manager) using the connection type ID 2 (Ieee 1284) cannot be used.

[0172] The effective user list 805 is a list of user IDs which can receive service if the sub address is effective. The invalid user list 806 is a list of user IDs which cannot receive service even if the sub address is effective. Only one of the effective user list 805 and invalid user list 806 is set with a value.

(Corresponding Table of Service ID - Task Type)

[0173] Fig. 11 is a corresponding table between a service ID and a task type. The task type indicates which task (which printer manager or the like) processes a requested task (service). This table is stored in the disk 315 as the attribute value of the attribute ID 1002 (table of SID - task type) of the attribute table shown in Fig. 7. The service ID - task type table indicates which type of service the service ID is assigned. Each row of the table corresponds to an information unit (record), and the data is constituted of a collection of a plurality of records. Each record includes a service ID 901 and a task type 902. The task type 902 indicates the type of service. Fig. 12 shows the meanings of the values of the task type 902. 0 indicates service by the supervisor, 1 indicates print service, 2 indicates scan service, 3 indicates copy service, 101 indicates font service, 102 indicates form overlay service, 103 indicates log service, and 104 indicates color copy service. The service ID is in one-to-one correspondence with a manager which provides service. Therefore, the service ID is also used for accessing a function table possessed by each manager. The function table is also possessed by each printer controller and each scanner controller. Therefore, a controller ID corresponding to the service ID is also assigned to the printer controller and scanner controller to access them. Therefore, the service ID - task type corresponding table also manages as to which type of the controller corresponds to the controller ID. The task type 201 indicates the printer controller, and the task type 202 indicates the scanner controller. The controller ID is in one-to-one correspondence with each controller shown in Figs. 4 and 5.

[0174] The meaning of the service ID is as follows.

0: supervisor 410

1: print job manager 501

2: print job manager 502

3: print job manager 503

4: print job manager 504

5: print job manager 505

6: print job manager 506

7: print job manager 507

8: print job manager 508

9: print job manager 509

10: scan job manager 419

11: copy job manager 601

12: copy job manager 602

13: copy job manager 603

14: copy job manager 604

15: copy job manager 605

16: copy job manager 606

17: copy job manager 607

18: copy job manager 608

101: font manager 413

102: form overlay manager 414

103: log manager 415

104: color profile manager 416

21: printer controller 510

22: printer controller 511

23: printer controller 512

24: scanner controller 420

(User Certification Table)

[0175] Fig. 13 is a user certification table possessed by the supervisor. This table shows certification information of a user capable of using devices. This table is stored in the disk 315 as the attribute value of the attribute ID 1003 (user certification table) of the attribute table shown in Fig. 7. The user certification table contains a combination of an effective user ID and a password, together with information of whether the user has an administrator privilege. Each row of the table corresponds to an information unit (record), and the data is constituted of a collection of a plurality of records. Each record includes a user ID 1001, a password 1002, and an administrator privilege flag 1003. The administrator privilege flag 1003 indicates whether the user has an administrator privilege.

(Access Control Table)

[0176] Fig. 14 is an access control table possessed by the supervisor. The access control table shows a security level of each service. This table is stored in the disk 315 as the attribute value of the attribute ID 1004 (access control table) of the attribute table shown in Fig. 7. The access control table contains a security level for each service ID and a list of users permitted to receive service. Each row of the table corresponds to an information unit (record), and the data is constituted of a collection of a plurality of records. Each record includes a service ID 1101, a security level 1102, and a user ID list 1103. The security level 1102 indicates certification information necessary for receiving the service designated by the service ID 1101, i.e., for issuing a command packet to the manger designated by the service ID 1101. Fig. 15 shows the meanings of security levels. The security level 0 indicates that user certification is not necessary, 1 indicates that only an administrator is discriminated, 2 indicates that only the certified user can receive service and that the user ID is used and the password is not used for the certification, and 3 indicates that only the certified user can receive service and that the user ID and password are used for the certification. The user ID list 1103 is a list of user (access) permitted user IDs if the security level 1102 is 2 or 3.

(Event Set Tabl)

[0177] Fig. 16 is an event set tabl possess d by the supervisor. Th event s t tabl is stored in the disk 315 as

the attribute value of the attribute ID 502 (event set table) of the attribute table shown in Fig. 7. The event set table stores for each type of an event a transmission method and a destination of an vent notice when a designated event occurs in a device. Each row of th table corresponds to an information unit (record), and the data is constituted of a collection of a plurality of records. Each record includes an ev nt ID 1201, a connection type 1202, and a notice destination address 1203. The destination is constituted of a connection type and a notice destination address dependent upon the connection type. The event ID 1201 identifies the type of an event and is uniquely defined in each device. For example, an event ID 200 indicates no paper sheet, an event ID 399 indicates no toner, an event ID 432 indicates no ink, and event ID 234 indicates a cover-open of MFP. The connection type ID 1201 identifies the connection type for transmitting an event notice. As the value of this connection type ID, the value same as that used by the sub address - service ID corresponding table shown in Fig. 9 is used. The notice destination address 1203 indicates a notice destination of the event proper for the connection type 1202. As the type of events, a notice may be sent to a client or each device when a job exceeding an account limit value is requested, when the account value becomes near the account limit value, or when the client whose access privilege is not permitted accesses.

(Event Format Table)

[0178] Fig. 17 is an event format table possessed by the supervisor. The event format table shows the contents of an event. The event format table is stored in the disk 315 as the attribute value of the attribute ID 503 (event format table) of the attribute table shown in Fig. 7. The event format table stores, for each event ID uniquely defined in each device, the format of additional data to be transmitted as the event notice. Each row of the table corresponds to an information unit (record), and the data is constituted of a collection of a plurality of records. Each record includes an event ID 1301 and an event format 1302. The event format 1302 shows a format of additional data to be transmitted as the event notice, and is given as the attribute ID list. The attribute ID is uniquely defined in each device, and its type is also determined solely by the attribute ID. By designating the attribute ID, the format of additional data can be identifier. For example, the attribute ID 676 of the event format 1302 indicates a paper size, the attribute ID 756 indicates the type of paper, the attribute ID 666 indicates the type of toner, the attribute ID 698 indicates the type of ink, and the attribute ID 600 indicates the position of a cover. As will be later described, the event transmission method and destination are set to the data (attribute table) possessed by each manager and controller so that an event occurred in each manager and controller can be notified. The format of additional data of such an event is stored in the event format table shown in Fig. 13. When a designated event occurs, the contents defined by the event format are notified together with data predetermined for each event ID.

(Account ID Table)

[0179] A table shown in Fig. 114 shows information on each account ID possessed by the supervisor. This table is stored in the disk 315 as the attribute value of the attribute ID 1105 (account ID table) of the attribute table shown in Fig. 7. This table shows a relation between an effective account ID, its user ID, and chargeable user ID. Each row of the table corresponds to an information unit (record), and the data is constituted of a collection of a plurality of records. Each record includes an account ID 8301, its user ID list 8302, and a chargeable user ID list 8303. The value used as the user ID cannot be used as the value of the account ID. The account ID is in one-to-one correspondence with its user ID. The number of user IDs may be zero. The account ID and chargeable user ID are in one-to-multiple relation and the number of user IDs may be zero.

(Current Count Data Table)

[0180] Fig. 115 is a current count data table possessed by the supervisor. This table shows a list of count data to be counted in the supervisor. This table is stored in the disk 315 as the attribute value of the attribute ID 401 (current count data table) of the attribute table shown in Fig. 7. Each row of the table corresponds to an information unit (record), and the data is constituted of a collection of a plurality of records. Each record includes a user ID or account ID 8401, and an attribute ID 8402. The meaning of the counter is the same as those of an attribute ID 402 "count data format". For example, count data 45, 78, 34, 13 of an account ID 2003 shows the number of prints having a paper size indicated by a count data format.

(Count Data Format Table)

[0181] Fig. 116 is a count data format table possessed by th supervisor. This tabl shows a list of attribut IDs. This table is stor d in the disk 315 as th attribut valu of th attribut ID 402 (count data format tabl) of the attribute table shown in Fig. 7. Each row of th tabl corresponds to an information unit (record), and the data is constituted of a collection of a plurality of records. Each r cord includ s a user ID or account ID 8501, and an

attribut ID 8502. Since the attribute ID is defined uniquely in each device, the meaning of th count data can b designated by designating the attribute ID. For xampl , the attribute value 565 of th attribute ID 402 indicat s the number of prints of a paper siz A2, the attribut valu 545 indicates the number of prints of a paper size A4, and the attribute value 523 indicates the number of prints of a paper size A5.

(Count Limit Data Table)

[0182] Fig. 117 is a count limit data table possessed by the supervisor. This table shows a maximum value which the attribute ID 401 "current count data" can take. This table is stored in the disk 315 as the attribute value of the attribute ID 403 (count limit data table) of the attribute table shown in Fig. 7. Each row of the table corresponds to an information unit (record), and the data is constituted of a collection of a plurality of records. Each record includes a user ID or account ID 8601, and a maximum value 8602. If any one of the value of the attribute ID 401 "current count data" exceeds the count limit data, CPU 301 invalidates the effective flag in the sub address - service ID corresponding table shown in Fig. 9 to thus invalidate all services by the manager.

(Count Unit Price Data Table)

[0183] Fig. 118 is a count unit price data table possessed by the supervisor. This table shows a unit price of a money denomination unit per one count by the attribute ID held in the attribute ID 402 "count data format". This table is stored in the disk 315 as the attribute value of the attribute ID 404 (count unit price data table) of the attribute table shown in Fig. 7. Each row of the table corresponds to an information unit (record), and the data is constituted of a collection of a plurality of records. Each record includes a user ID or account ID 8701, and a unit price 8702.

(Current Account Data Table)

[0184] Fig. 119 is a current account data table possessed by the supervisor. This table shows a total sum of the value of the attribute ID 401 "current count data" multiplied by the value of the value of the attribute ID 404 "count unit price data". This table is stored in the disk 315 as the attribute value of the attribute ID 405 (current account data table) of the attribute table shown in Fig. 7. Each row of the table corresponds to an information unit (record), and the data is constituted of a collection of a plurality of records. Each record includes a user ID or account ID 8801, and a current account 8802.

(Account Limit Data Table)

[0185] Fig. 120 is an account limit data table possessed by the supervisor. This table shows a maximum value the attribute ID 405 "current account data" can take. This table is stored in the disk 315 as the attribute value of the attribute ID 406 (account limit data table) of the attribute table shown in Fig. 7. Each row of the table corresponds to an information unit (record), and the data is constituted of a collection of a plurality of records. Each record includes a user ID or account ID 8901, and an account limit 8902. If the attribute ID 405 "current account data" exceeds the attribute ID 406 "account limit data", CPU 301 invalidates the effective flag in the sub address - service ID corresponding table shown in Fig. 9 to thus invalidate all services by the manager.

(Attribute Table of Print Job Manager)

[0186] Fig. 18 shows the data (attribute table) which each print job manager (control program) 501 - 509 stores in the disk 315. This table shows the performance and function of a print job which the print manager can process. Each row of the table corresponds to an information unit (record), and the data is constituted of a collection of a plurality of records. The contents of each record are the same as those of the supervisor shown in Fig. 7, and are constituted of an attribute ID 1401, a type ID 1402, and a value 1403. Fig. 19 is a diagram showing the attribute ID 1401 and type ID 1402 of the attribute table shown in Fig. 18. The attribute table shown in Fig. 19 includes a type ID 203 (job table type), a type ID 204 (job request table type), a type ID 81 (prohibited attribute combination list type 1), a type ID 82 (prohibited attribute combination list type 2), a type ID 83 (prohibited attribute combination list type 3), a type ID 84 (prohibited attribute combination list type 4), and a type ID 85 (prohibited attribute combination list type 5), and other type IDs same as those used by the attribute table of the supervisor shown in Fig. 7.

[0187] An attribute ID 601 "supported data download process" indicates a process of transmitting print document data to each device. In this embodiment, the supported process includes a process wherein document data is contained in a job and a process wherein a ref rence pointer (unifi d resourc locator (URL)) of document data is contain d in a job and the document data designated by th r f r nce pointer is read by each device when n cessary.

[0188] Attribute IDs 801 to 805 indicate prohibition s tting attributes for limiting the attribut to be set to the print job

which is given to the print manager. For example, these attribute IDs are us d to indicate a limit item such as that th finisher setting becomes impossible when the number of copies xceeds 100. Th prohibition setting attributes includ fiv types of limiting the attribute. An attribute ID 801 holds a list of a plurality of pairs of (one attribut ID 1) and (anoth r attribute ID 2), as represented by {attribut ID1 : {attribute ID 2}}. This means that if the attribute ID 1 is set, the other attribute ID 2 cannot be set in a print job script.

[0189] An attribute ID 802 holds a list of a plurality of pairs of (an attribute ID 1, an operator identifier, and its value) and (another attribute ID 2), as represented by {attribute ID1 : operator identifier: value : {attribute ID 2}}. This means that if the result that for the attribute ID 1 an operator designated by the operator identifier is applied to the value, is true, then each attribute ID 2 cannot be set in a print job script. The integer value of the operator identifier is on-to-one correspondence with a dyadic operation. For example, 0 indicates "= (equal)".

[0190] An attribute ID 803 holds a list of a plurality of pairs of (an attribute ID 1, an operator identifier 1, and its value 1) and (another attribute ID 2, anther operator identifier 2, and its value 2), as represented by {attribute ID1: operator identifier 1: value 1: {attribute ID 2; operator identifier 2; value 2}}. This means that if the result that for the attribute ID an operator designated by the operator identifier 1 is applied to the value 1, is true, then a print job script cannot be set in such a manner that for each attribute ID 2 the result of applying an operator identified by the operator identifier 2 to the value 2, becomes true.

[0191] An attribute ID 804 holds a list of a plurality of pairs of [(an attribute ID 1, an operator identifier 1, and its value 1), (another operator identifier 3) and (another attribute ID 2, anther operator identifier 2, and its value 2)] and [another attribute ID3], as represented by {(attribute ID1: operator identifier 1: value 1) : operator identifier 3 : (attribute ID 2; operator identifier 2; value 2} : {attribute ID 3}}. This means that if the result of the operation designated by the operator identifier 3 between the result of applying an operator designated by the operator identifier 1 to the value 1 for the attribute ID 1 and the result of applying an operator designated by the operator identifier 2 to the value 2 for the attribute ID 2, is true, then the attribute ID 3 cannot be set in a print job script.

[0192] An attribute ID 805 holds a list of a plurality of pairs of [(an attribute ID 1, an operator identifier 1, and its value 1), (another operator identifier 3) and (another attribute ID 2, another operator identifier 2, and its value 2)] and [another attribute ID3, another operator identifier 4 and its value 4], as represented by {(attribute ID1: operator identifier 1: value 1) : operator identifier 3 : (attribute ID 2; operator identifier 2; value 2} : {attribute ID 4; operator identifier 4; value 4}}. This means that if the result of the operation designated by the operator identifier 3 between the result of applying an operator designated by the operator identifier 1 to the value 1 for the attribute ID 1 and the result of applying an operator designated by the operator identifier 2 to the value 2 for the attribute ID 2, is true, then a print job script cannot be set in such a manner that for each attribute ID 4 the result of applying an operator identified by the operator identifier 4 to the value 4, becomes true.

[0193] An attribute ID 2001 "list of IDs of controllers for executing a job (having a possibility of execution)" is a list of IDs of controllers for executing a print job, and the print job managers other than the print job manager 508 essentially correspond to the controllers for executing a job. Since the print job manager 508 dynamically select the controller in accordance with the function requested by a job, this attribute indicates a range of controller selection. An attribute ID 2002 "controller automatically selectable or not" indicates whether the print job manager automatically selects the controller. In this embodiment, only the print job manager 508 has this attribute as true. The other attributes ID are the same as those shown in the attribute table of the supervisor shown in Fig. 7. However, the setting and influence range is limited only to those controllers under the management of the print job managers belonging to the attribute table. For example, an attribute ID 101 "supported operation" is a list of operations capable of being issued to the corresponding print job manager. An attribute ID 406 "account limit data" limits an account for the print job executed by the corresponding print job manager. If the account limit is exceeded, only the service of this print job manager is invalidated and services of the other managers are not influenced. The attribute table of the print job manager shown in Fig. 18 is the attribute table (print job manager 504) for the service ID 4. Different attribute tables of the other attribute job managers 501, 502, 503, 505, 506, 507, 508 and 509 corresponding to the service IDs 1, 2, 3, 5, 6, 7, 8 and 9 are stored in the disk 315.

[0194] An attribute ID 10001 "maximum printable number of copies" indicates the maximum printable number of copies which the print job can obtain. An attribute ID 106 "current status" shows the current status of the print job manager. The attribute value 0 indicates a normal state, the attribute value 1 indicates a normal state with restriction, and the attribute value 2 indicates an abnormal state that service is not available. An attribute ID 107 "list of attributes to be referred when job can be executed with restriction" shows those attributes when the attribute value of the attribute ID 106 is 1 indicating the normal state with restriction. An attribute ID 108 "list of trouble reasons" shows those attributes indicating "reason for trouble" when the attribute value of the attribute ID 106 is 2 indicating an abnormal state and unavailabl service. In accordance with the current status, the scan job manager always changes dynamically the value of ach of the attributes IDs 106, 107 and 108 and the valu of each attribute indicated by the valu of th attribute ID 107.

[0195] In the exampl of th attribute tabl shown in Fig. 18, the state of the print job manager is "normal

(attribut value = 1) with restriction" and this restriction pertains to th attribute ID 10001 "maximum printable number of copies (attribute value = 10)).

(Job Table)

[0196] Fig. 20 shows data (job table) possessed by a print job manager. This table shows a correspondence between the name of a file storing the entity of a job managed by the print manager and a job ID. This table is stored in RAM 302 as the attribute value of the attribute ID (job table) of the attribute table shown in Fig. 18. The print job manager dynamically changes the job table in RAM 302 and stores it in the disk 315 when necessary. Each row of the table corresponds to an information unit (record), and the data is constituted of a collection of a plurality of records. Each record includes a job ID 1501 and the name 1502 of a file storing the entity of the job. The job ID 1501 is an identifier of a job assigned by the print job manager which received the job. The job file name 1502 indicates the name of a file storing the entity of the job. As shown in Fig. 52, the entity of a job is constituted of a plurality of pairs of an attribute ID, an attribute value size and an attribute value.

(Job Request Table)

[0197] Fig. 21 is a job request table possessed by the print manager and indicating a relation between a job to be managed by the print manager and a job to be executed by the controller. This table is stored in the disk 315 as the attribute value of the attribute ID 2004 (job request table) of the attribute table shown in Fig. 18. The job request table indicates which controller is executing the job managed by the print job manager as which job. Each row of the table corresponds to an information unit (record), and the data is constituted of a collection of a plurality of records. Each record includes a controller ID 1504 and a job ID 1505 assigned to the controller. The job ID 1503 is an identifier of a job assigned by the print job manager which received the job, and corresponds to the Job ID 1501 of the job table (Fig. 20). The controller ID 1504 is an identifier of the controller which is executing the job. The job ID 1505 is an identifier of the job assigned by the controller which executes the job.

(Attribute Table of Scan Job Manager)

[0198] Fig. 22 shows the data (attribute table) possessed by the scan job manager 419. This table shows the performance and function of a scan job which the scan job manager can process. Each row of the table corresponds to an information unit (record), and the data is constituted of a collection of a plurality of records. The contents of each record are the same as those of the supervisor shown in Fig. 7, and are constituted of an attribute ID 1601, a type ID 1602, and a value 1603. Fig. 23 is a diagram showing the attribute ID and type ID of the attribute table shown in Fig. 22. An attribute ID 602 "supported data upload process" indicates a process of transmitting scan document data to each device. In this embodiment, the supported process includes a process wherein document data is contained in a transmitted job and a process wherein a reference pointer (unified resource locator (URL)) of document data held in a device is contained in a transmitted job and the document data designated by the reference pointer is read by a host (client) when necessary. An attribute ID 1201 "list of supported image formats" indicates a supported image data format, and an attribute ID 1203 "settable resolution list" indicates a settable resolution. When a scan job is issued, the data format and resolution in these tables can be designated. An attribute ID 1204 "distinguishable original type" indicates a type (monochrome or color, text or image and the like) of an original distinguishable with a sensor function of the scanner engine 102. When a scan job is issued, a combination of types can be selected and the data format and resolution for each such a combination can be designated. One of the types shows a specific value representative of "prescan". This type is used for selecting the data format and resolution when a prescan is set. The job table for the attribute ID 108 is the same as that shown in Fig. 20 and possessed by the print manager.

[0199] The other attribute IDs are the same as those used in the attribute table of the supervisor shown in Fig. 7. However, the setting and influence range is limited only to those under the management of the scan job managers belonging to the attribute table. The type IDs other than the type ID 203 (job table type) in the attribute table shown in Fig. 23 are the same as those used in the attribute table of the supervisor shown in Fig. 7. An attribute ID 106 "current status" shows the current status of the scan job manager. The attribute value 0 indicates a normal state, the attribute value 1 indicates a normal state with restriction, and the attribute value 2 indicates an abnormal state that service is not available. An attribute ID 107 "list of attributes to be referred when job can be executed with restriction" shows those attributes when the attribute value of the attribute ID 106 is 1 indicating the normal state with restriction. An attribute ID 108 "list of trouble reasons" shows those attributes indicating "reason for trouble" when th attribute valu of the attribute ID 106 is 2 indicating an abnormal stat and unavailable service. In accordance with th current status, the scan job manager always changes dynamically the valu of ach of the attributes IDs 106, 107 and 108 and the valu of each attribute indicated by the valu of the attribut ID 107.

(Attribute Table of Copy Job Manager)

[0200] Fig. 24 shows the data (attribut tabl) possessed by each of the copy job managers 601 to 608. This table shows th performanc and function of a copy job which the copy job manager can process. Each row of the table corresponds to an information unit (r cord), and the data is constituted of a collection of a plurality of records. Th contents of each record are the same as those of the supervisor shown in Fig. 7, and are constituted of an attribute ID 1701, a type ID 1702, and a value 1703. Fig. 25 is a diagram showing the attribute ID 1701 and type ID 1702 of the attribute table shown in Fig. 24. An attribute ID 1302 "color print available or not", an attribute ID 1303 "supported finishing type", an attribute ID 1304 "maximum settable resolution", an attribute ID 1305 "minimum settable resolution", an attribute ID 2001 "list of controller IDs having a possibility of executing a job", an attribute ID 200 "controller automatically settable or not", and an attribute ID 2003 "job table" are the same as those described with respect to the print job manager and scan job manager. The attribute IDs and type IDs other than the attribute ID 1302 "color print available or not", attribute ID 1303 "supported finishing type", attribute ID 1304 "maximum settable resolution", attribute ID 1305 "minimum settable resolution", attribute ID 2001 "list of controller IDs having a possibility of executing a job", attribute ID 200 "controller automatically settable or not", attribute ID 2003 "job table" and a type ID 203 (job table type) are the same as those used by the attribute table of the supervisor shown in Fig. 7. The attribute table of the copy job manager shown in Fig. 24 corresponds to the attribute table (copy job manager 608) having the service ID 18, and different attribute table corresponding to the copy job managers 601, 602, 603, 604, 605, 606 and 607 are stored in the disk 315. An attribute ID 10001 "maximum printable number of copies" shows the maximum number of copies printable by a copy job. An attribute ID 106 "current status" shows the current status of the copy job manager. The attribute value 0 indicates a normal state, the attribute value 1 indicates a normal state with restriction, and the attribute value 2 indicates an abnormal state and unavailable service. An attribute ID 107 "list of attributes to b referred when job can be executed with restriction" shows those attributes when the attribute ID 106 has the attribute value 1 indicating the normal state with restriction. An attribute ID 108 "list of troubles" shows those attributes of "reason of trouble" when the attribute value of the attribute ID 106 is 2 indicating the abnormal state and unavailable service. In accordance with the current status, the copy job manager always changes dynamically the value of each of the attributes IDs 106, 107 and 108 and the value of each attribute indicated by the value of the attribute ID 107.

(Attribute Table of Font Manager)

[0201] Fig. 26 shows the data (attribute table) possessed by the font manager 413. This table shows the type of fonts usable by the font manager and the list of fonts under management by the font manager. Each row of the table corresponds to an information unit (record), and the data is constituted of a collection of a plurality of records. The contents of each record are the same as those of the supervisor shown in Fig. 7, and are constituted of an attribute ID 1801, a type ID 1802, and a value 1803. Fig. 27 is a diagram showing the attribute ID 1801 and type ID 1802 of the attribute table shown in Fig. 26. The attribute IDs and type IDs other than an attribute ID 601 "supported data download process", an attribute ID 602 "supported data upload process", an attribute ID 1501 "list of supported font types", an attribute ID 1502 "maximum number of current fonts", an attribute ID 1504 "list of stored fonts", and a type ID 150 "font table" are the same as those of the attribute table of the supervisor shown in Fig. 7. However, the setting and influence range is limited only to those under the management of the font manager belonging to the attribute table. Th attribute ID 601 "supported data download process" and attribute ID 602 "supported data upload process" are the same as those described with the print job manager and scan job manager, and indicate the download and upload processes for supported font data. An attribute ID 106 "current status" shows the current status of the font manager. The attribute value 0 indicates a normal state, the attribute value 1 indicates a normal state with restriction, and the attribute value 2 indicates an abnormal state and unavailable service. An attribute ID 107 "list of attributes to be referred when job can be executed with restriction" shows those attributes when the attribute ID 106 has the attribute value 1 indicating the normal state with restriction. An attribute ID 108 "list of troubles" shows those attributes of "reason of trouble" when the attribute value of the attribute ID 106 is 2 indicating the abnormal state and unavailable service. In accordance with the current status, the font manager always changes dynamically the value of each of the attributes IDs 106, 107 and 108 and the value of each attribute indicated by the value of the attribute ID 107.

(Font Table)

[0202] Fig. 28 is a font table possessed by the font manager. This table is stored in the disk 315 as the attribute value of the type ID 1504 (font table) of the attribute table shown in Fig. 26. The font table shows which fonts the font manager currently manages. Each row of the tabl corresponds to an information unit (record), and th data is constituted of a collection of a plurality of records. The contents of each record ar a font ID 1901, a font typ 1902, a font name 1903 and a font data file name 1904. The font data is stored in th disk 315, and the font ID 1901 is an identifier of a font assigned by the font manager when font data is downloaded in RAM 302.

(Attribute Table of Font Overlay Manager)

[0203] Fig. 29 shows the data (attribute table) stored in th disk 315 and possessed by th form overlay manager 414. This table shows the format of a form ov rlay th form overlay manager can process and a list of current form overlays the form overlay manager manages. Each row of the table corresponds to an information unit (record), and the data is constituted of a collection of a plurality of records. The contents of each record are the same as those of the supervisor shown in Fig. 7, and are constituted of an attribute ID 2001, a type ID 2002, and a value 2003. Fig. 30 is a diagram showing the attribute ID and type ID of the attribute table shown in Fig. 29. The attribute IDs and type IDs other than an attribute ID 601 "supported data download process", an attribute ID 602 "supported data upload process", an attribute ID 1601 "list of formats of supported font overlays", an attribute ID 1602 "maximum number of storable form overlays", an attribute ID 1603 "number of form current form overlays", an attribute ID 1604 "list of stored form overlays", and a type ID 160 "form table" are the same as those of the attribute table of the supervisor shown in Fig. 7. However, the setting and influence range is limited only to those under the management of the form overlay manager belonging to the attribute table. The attribute ID 601 "supported data download process" and attribute ID 602 "supported data upload process" are the same as those described with the print job manager and scan job manager, and indicate the download and upload processes for supported form overlays. An attribute ID 106 "current status" shows the current status of the font overlay manager. The attribute value 0 indicates a normal state, the attribute value 1 indicates a normal state with restriction, and the attribute value 2 indicates an abnormal state and unavailable service. An attribute ID 1067 "list of attributes to be referred when job can be executed with restriction" shows those attributes when the attribute ID 106 has the attribute value 1 indicating the normal state with restriction. An attribute ID 108 "list of troubles" shows those attributes of "reason of trouble" when the attribute value of the attribute ID 106 is 2 indicating the abnormal state and unavailable service. In accordance with the current status, the form overlay manager always changes dynamically the value of each of the attributes IDs 106, 107 and 108 and the value of each attribute indicated by the value of the attribute ID 107.

(Form Overlay Table)

[0204] Fig. 31 is a form overlay table possessed by the form overlay manager 414. This table is stored in the disk 315 as the attribute value of the attribute ID 1604 (form overlay table) of the attribute table shown in Fig. 29. The form overlay table shows which form overlays the form overlay manager currently manages. Each row of the table corresponds to an information unit (record), and the data is constituted of a collection of a plurality of records. The contents of each record are a font overlay ID 2101, a form overlay data format 2102, a form overlay name 2103 and a form overlay data file name 2104. The form overlay data is stored in the disk 315, and the form overlay ID 2101 is an identifier of a form overlay assigned by the form overlay manager when form overlay data is downloaded in RAM 302.

(Attribute Table of Log Manager)

[0205] Fig. 32 shows the data (attribute table) stored in the disk 315 and possessed by the log manager 415. This table shows the list of logs the log manager currently manages. Each row of the table corresponds to an information unit (record), and the data is constituted of a collection of a plurality of records. The contents of each record are the same as those of the supervisor shown in Fig. 7, and are constituted of an attribute ID 2201, a type ID 2202, and a value 2203.

[0206] Fig. 33 is a diagram showing the attribute ID and type ID of the attribute table shown in Fig. 32. The attribute IDs and type IDs other than an attribute ID 602 "supported data download process", an attribute ID 703 "number of stored logs", an attribute ID 1704 "log table", an attribute ID 1705 "log format table", a type ID 170 "log table", and a type ID 171 "log format table type" are the same as those of the attribute table of the supervisor shown in Fig. 7. However, the setting and influence range is limited only to those under the management of the log manager belonging to the attribute table. The attribute ID 601 "supported data download process" and attribute ID 602 "supported data upload process" are the same as those described with the print job manager and scan job manager, and indicate the download and upload processes for supported form overlays. An attribute ID 106 "current status" shows the current status of the font overlay manager. The attribute value 0 indicates a normal state, the attribute value 1 indicates a normal state with restriction, and the attribute value 2 indicates an abnormal state and unavailable service. An attribute ID 1067 "list of attributes to be referred when job can be executed with restriction" shows those attributes when the attribute ID 106 has the attribute value 1 indicating the normal state with restriction. An attribute ID 108 "list of troubles" shows those attributes of "reason of trouble" when the attribute value of the attribute ID 106 is 2 indicating the abnormal state and unavailable service. In accordance with the current status, the form overlay manager always changes dynamically the value of each of the attributes IDs 106, 107 and 108 and the value of each attribute indicated by the value of the attribute ID 107.

(Log Tabl)

[0207] Fig. 34 is a log tabl possess d by th log manager 415. This tabl is stored in th disk 315 as the attribut value of the attribut ID 1704 (log table) of the attribut tabl shown in Fig. 32. The log tabl shows which logs the form overlay manager currently manages. Each row of the table corresponds to an information unit (record), and the data is constituted of a collection of a plurality of records. The contents of each record are a log ID 2301 and a log data file name 2302. The log ID 2301 is an identifier of a log predetermined for each type.

(Contents of Log Data)

[0208] Fig. 35 shows the contents of log data stored in the disk 315 and managed by the log manager. The log data is constituted of a collection of log records. Each log record is constituted of a log format ID 2401, a record date/time 2402, and log data 2403. The log format ID 2401 make reference to log format information recorded in a log format table shown in Fig. 36, and indicates the format of the log data 2403. For example, log data "12345,4,1. 23, "OK"" of a log format ID 1 means that the user ID which issues a job to the print job manager having the service ID 1 is "12345", the number of output paper sheets is "4", the quantity of toner is "1.23", and the job completion state is "OK".

(Log Format Table)

[0209] Fig. 36 is a log format table possessed by the log manager 415. This table is stored in the disk 315 as the attribute value of the attribute ID (log format table) of the attribute table shown in Fig. 32. The log format table shows the formats of logs in log data managed by the log manager 415. Each row of the table corresponds to an information unit (record), and the data is constituted of a collection of a plurality of records. The contents of each record are a log format ID 2501 and a log format 2502. The log format is described as a list of pairs of a service ID and an attribute ID. The attribute ID is defined uniquely for each device, and its type is also uniquely determined in accordance with the attribute ID. Therefore, by designating the attribute ID, the format of log data can be identified. The list of pairs of the service ID and attribute ID in the log format 2502 and the list of the value in the log data 2403 are in sequential correspondence with each other. For example, the third pair of the service ID and attribute ID in the list of the log format 2502 corresponds to the format represented by the third value in the log data. For example, the format "1 : 701, : 565,1 : 765,1 : 777" corresponds respectively to the user ID 1 of the user issued a job to the print job manager, the number of output paper sheets, the quantity of used toner, and the job termination state. The format "11 : 701,11 : 565,11 : 765,11 : 777" corresponds respectively to the user ID 11 of the user issued a job to the print job manager, the number of output paper sheets, the quantity of used toner, and the job termination state.

(Attribute Table of Color Profile Manager)

[0210] Fig. 37 shows the data (attribute table) stored in the disk 315 and possessed by the color profile manager 416. This table shows the format of a color profile the color profile manager can process and the list of color profiles th color profile manager currently manages. Each row of the table corresponds to an information unit (record), and the data is constituted of a collection of a plurality of records. The contents of each record are the same as those of the supervisor shown in Fig. 7, and are constituted of an attribute ID 2601, a type ID 2602, and a value 2603. Fig. 38 is a diagram showing the attribute ID and type ID of the attribute table shown in Fig. 37. The attribute IDs other than an attribute ID 601 "supported data download process", an attribute ID 602 "supported data upload process", an attribute ID 1801 "list of supported formats of color profile data", an attribute ID 1802 "maximum number of storable color profiles", an attribute ID 1804 "number of current color profiles", an attribute ID 1804 "number of color profiles", and a type ID 180 "color profile table type) are the same as those of the attribute table of the supervisor shown in Fig. 7. However, the setting and influence range is limited only to those under the management of the color profile manager belonging to the attribute table. The attribute ID 601 "supported data download process" and attribute ID 602 "supported data upload process" are the same as those described with the print job manager and scan job manager, and indicate the download and upload processes for supported font data. An attribute ID 106 "current status" shows the current status of the color profile manager. The attribute value 0 indicates a normal state, the attribute value 1 indicates a normal state with restriction, and the attribute value 2 indicates an abnormal state and unavailable service. An attribute ID 107 "list of attributes to be referred when job can be executed with restriction" shows those attributes when the attribute ID 106 has the attribute value 2 indicating the abnormal state and unavailable service. In accordance with the current status, the color profil manager always changes dynamically the value of each of the attributes IDs 106, 107 and 108 and th value of each attribute indicated by the value of th attribut ID 107.

(Color Profile Table)

[0211] Fig. 39 is a color profil tabl possessed by the color profile manager. This tabl is stored in the disk 315 as the attribute value of th attribut ID 1804 (color profile table) of the attribute tabl shown in Fig. 37. The color profil table shows which color profiles the color profile manager manages currently. Each row of the tabl corresponds to an information unit (record), and the data is constituted of a collection of a plurality of records. Th contents of each record are a color profile ID 2701, a color profile format 2702 and a color profile data file name 2703. The color profile ID 2701 is an identifier of a color profile assigned by the color profile manager when the color profile data is downloaded. The color profile data is correction data to be used for color matching of the data sent from the scanner engine 102 or to the ink jet printer engine 105.

(Attribute Table of Printer Controller)

[0212] Fig. 40 shows the data (attribute table) stored in the disk 315 and possessed by each of the printer controllers 510, 511 and 512. This table shows the function and performance of the print engine and finisher controlled by the print controller. The values regarding the function and performance cannot be rewritten. Each row of the table corresponds to an information unit (record), and the data is constituted of a collection of a plurality of records. The contents of each record are the same as those of the supervisor shown in Fig. 7, and are constituted of an attribute ID 2801, a type ID 2802, and a value 2803. Fig. 41 is a diagram showing the attribute ID and type ID of the attribute table shown in Fig. 40. The attribute IDs and type IDs other than an attribute ID 12 "controller type", an attribute ID 12 "controller ID", an attribute ID 5001 "color print available or not", an attribute ID 5002 "type of supported finishing), an attribute ID 5003 "maximum settable resolution", an attribute ID 5004 "minimum settable resolution", an attribute ID 5005 "job queue table", and a type ID 500 "job queue table type" are the same as those of the attribute table of the supervisor shown in Fig. 7. However, the setting and influence range is limited only to those under the management of the printer controller belonging to the attribute table. Different attribute tables of the other printer controllers 511 and 512 corresponding to the service IDs 22 and 23 are stored in the disk 315.

(Job Queue Table)

[0213] Fig. 42 is a job queue table possessed by the printer controller. This table is stored in the disk 315 as the attribute value of the attribute ID 5005 (job queue table) of the attribute table shown in Fig. 40. The job queue table shows the state of jobs to be managed and executed by the printer controller. Each row of the table corresponds to an information unit (record), and the data is constituted of a collection of a plurality of records. The contents of each record are a job ID 2901, a job status 2902 and a job data file name 2903. The job ID 2901 is an identifier of a job assigned by the printer controller when the job is issued to the printer controller. Fig. 43 is a diagram explaining the contents of the job status 2902 shown in Fig. 42. 1 indicates a job execution completion, 2 indicates a job under execution by an engine, and 3 indicates an execution standby. The job file name 2903 indicates the name of a file which stores the entity of the job. As shown in Fig. 52, the job entity is constituted of a plurality sets of an attribute ID, an attribute size and an attribute value.

(Attribute Table of Scanner Controller)

[0214] Fig. 44 shows the data (attribute table) stored in the disk 315 and possessed by the scanner controller 420. This table shows the performance and function of the scanner engine to be controlled by the scanner controller. The value of the performance and function cannot be rewritten. Each row of the table corresponds to an information unit (record), and the data is constituted of a collection of a plurality of records. The contents of each record are the same as those of the supervisor shown in Fig. 7, and are constituted of an attribute ID 3001, a type ID 3002, and a value 3003. Fig. 45 is a diagram showing the attribute ID and type ID of the attribute table shown in Fig. 44. The attribute IDs other than an attribute ID 12 "controller type", an attribute ID 13 "controller ID", an attribute ID 6001 "color scanning available or not", an attribute ID 6002 "maximum original size", an attribute ID 6003 "maximum settable resolution" and an attribute ID 6004 "minimum settable resolution" are the same as those of the attribute table of the supervisor shown in Fig. 7. However, the setting and influence range is limited only to those under the management of the printer controller belonging to the attribute table.

(Structure of Command Packet)

[0215] Fig. 46 shows the structure of a command packet to be output to the interpreter 409 from the user interface manager 405, TCP/IP - UDP/IP process module 406, IEEE 1284.4 process modul 407 and SBP-2 process module 408. This structure of th command packet shows also th structure of an answer packet and an event packet which ar transferr d from th interpret r 409 to th user interface manager 405, TCP/IP - UDP/IP proc ss module 406, IEEE 1284.4

process modul 407 and SBP-2 process modul 408. The packet contains: a packet header 3101 at the head of th packet; a packet v rsion 3102 indicating a packet structure version; a flag 3103 indicating a packet character; an operation code indicating an operation type; a block number 3105 used by the client to recognize an answer packet; a parameter length 3106 indication the length of a parameter 3110; a user ID 3107 and a password 3108 used for user certification; a status cod 3109 which is used only with an answ r packet and indicates th general state of an answer; and the parameter 3110 having a format determined for each operation code 3105. The parameter 3110 includes an access object service ID, an access object attribute ID and the like. The flag 3104 includes a flag 3111 indicating whether the packet is a command packet/event packet or an answer packet and a flag 3112 indicating that data to be entered in the parameter cannot be entered in the parameter and some data is also entered in the next packet. The length of the parameter 3110 is limited to the value (64 K bytes) indicated by the parameter length 3106. Specifically, the client PCs 202 and 203 connected to the Ethernet interface 208 designate the IP address and port number to connect MFP 201 and output IP packet data to the network interface 305 (107). The client PC 204 connected to the IEEE 1394 interface 206 designates the node ID and LUN (logical unit number) to connect MFP 201 and output SBP-2 packet data to the IEEE 1394 interface 306 (108). The client PC 205 connected to the IEEE 1284 interface 207 designates the socket number to connect MFP 201 and output IEEE 1284.4 packet data to the IEEE 1284 interface 307 (1098). The network interface driver 402, IEEE 1284 interface driver 403 and IEEE 1394 interface driver 404 add the IP header, 1284 header and 1394 header to the top of each command packet shown in Fig. 46 and output the generated transport packet to the TCP/IP - UDP/IP process module 406, IEEE 1284.4 process module 407 and SBP-2 process module 408. The TCP/IP - UDP/IP process module 406, IEEE 1284.4 process module 407 and SBP-2 process module 408 process each input transport packet to extract the command packet and output it to the interpreter/generator 409.

(Process for Command Packet)

[0216] Fig. 47 is a flow chart illustrating a command packet process to be executed by MFP 201. At Step 3201 each of the transport process modules 405, 406, 407 and 408 processes corresponding data input from each of the interfaces 401, 402, 403 and 404 to extract the command packet shown in Fig. 46. The extracted command packet together with the data input connection type information (connection type ID) and sub address are supplied to the interpreter 409 from the TCP/IP - UDP/IP process module 406, IEEE 1284.4 process module 407 and SBP-2 process module 408. At Step 3202 the interpreter 409 refers to the sub address - service ID corresponding table (Fig. 9) possessed by the supervisor 410 and compares the input connection type ID and sub address with the service ID to thereby acquire the service ID and check whether the input data is valid. If the check result indicates that the input data is not valid, then at Step 3204 the command packet is cancelled to terminate the process. If the input data is valid, then at Step 3203 the command packet is analyzed in accordance with the packet structure shown in Fig. 46. After the packet analysis, each item shown in Fig. 46 is output as independent information. At Step 3205 the access control table (Fig. 14) is referred to in accordance with the service ID to acquire the security level corresponding to the service ID and also acquire account data.

[0217] At Step 3206 it is checked whether the security level acquired at Step 3205 is 0 or 1. If the security level is 0 or 1, the security level is not checked (security gate 411), it is supplied to the despatcher 412. If it is judged at Step 3206 that the security level is neither 0 nor 1, it is checked at Step 3207 whether the security level is 2. If the security level is 2, it is checked at Step 3209 whether the user ID (UID) contained in the command packet exists in the user certification table (Fig. 13). If the user ID does not exists, it is judged that there is no privilege and at Step 3210 error answer information is generated and the interpreter 409 generates a packet (embeds the error information in the status code 3109) to transmit it to the command packet transmission side. If the user ID exists, it is passed to the dispatcher 412. The transmission side address is extracted from the transport packet (header). If it is judged at Step 3207 that the security level is not 2, it is checked whether the pair of the user ID and password contained in the command packet exists in the user certification table (Fig. 13). If the pair of the user ID and password does not exist, it is judged that there is no privilege, and at Step 3211 error answer information is generated and the interpreter 409 generates a packet and transmit is to the command packet transmission side. If the user ID exists, it is supplied to the dispatcher 412. At Step 3212 it is checked from the account data acquired at Step 3205 whether the charge object matches the user ID. If not, it is judged that the account ID (AID) is charged, and at Step 3213 it is checked whether there is a designated account ID. If there is a designated account ID, it is checked at Step 3214 from the account ID table (Fig. 114) whether the user ID belongs to the designated account ID or a charge is permitted. If neither of them are satisfied, it is judged that there is no privilege, and at Step 3215 error answer information is generated and the interpreter 409 generates a packet which is transmitted to the command packet transmission side. If the user ID belongs to th account ID or the charge is permitted, the account ID is supplied to the dispatcher 412. If it is judged at Step 3213 that there is no designated account ID, then at Step 3216 th account ID belonging to the user ID is searched from the account ID table (Fig. 114). If the account ID cannot be found, it is judged that there is no privilege, and at Step 3217 error answer information is generated and the interpret r 409 generates a packet and transmits it to the command

packet transmission side. If the account ID belonging to th user ID is found, the account ID is supplied to th dispatcher 412. At St p 3218 th dispatch r 412 det rmines the dispatch destination manager in accordance with th servic ID, and dispatch s to the d termined manager the data input connection type ID, sub address, transmission side address, operation cod , block number, flag information, user ID, password, parameter length, parameter and account object ID. At Step 3219, each manager proc ss s th received information.

(Access Process for Attribute Table)

[0218] Fig. 48 is a flow chart illustrating a process to be executed when a client instructs to read/write the attribute table of each manager and each controller possessed by MFP 201. Read/write of the attribute table possessed by each manager and each controller is conducted by transmitting a proper command packet to the corresponding sub address possessed by the supervisor. The parameters of an attribute read command packet include an access object service ID and an access object attribute ID. The parameters of an attribute write command packet include an access object service ID, an access object attribute ID and an attribute value corresponding to the attribute ID. Packet data transferred to MFP 201 is processed in the manner illustrated in the flow chart of Fig. 47 and supplied to the supervisor. At Step 3301 it is checked whether the operation code 3104 is an attribute value read code "Get". If "Get", the whole contents of the attribute table of the access object are acquired in accordance with the service ID. Acquired are: the attribute table of the supervisor 410 shown in Fig. 7 if the service ID is 0; the attribute table of the print job manager shown in Fig. 18 if the service ID is 1, 2, 3, 4, 5, 6, 7, 8 or 9; the attribute table of the scan job manager 419 shown in Fig. 22 if the service ID is 11, 12, 13, 14, 15, 16, 17, or 18; the attribute table of the font manager 413 shown in Fig. 26 if the service ID is 101; the attribute table of the form overlay manager 414 shown in Fig. 29 if the service ID is 102; the attribute table of the log manager 415 shown in Fig. 32 if the service ID is 103; the attribute table of the color profile manager 416 shown in Fig. 37 if the service ID is 104; the attribute table of the printer controller shown in Fig. 40 if the service ID is 21, 22 or 23; and the attribute table of the scanner controller 420 shown in Fig. 44 if the service ID is 24. The attribute table of the print job manager shown in Fig. 18 is the attribute table (print job manager 504) corresponding to the service ID 4. The attribute tables of the print job managers 501, 502, 503, 505, 506, 507, 508, and 509 corresponding to the service IDs 1, 2, 3, 5, 6, 7, 8, and 9 are stored in the disk 315. Similarly, the attribute table of the copy job manager shown in Fig. 24 is the attribute table (copy job manager 608) corresponding to the service ID 18. The attribute tables of the copy job managers 601, 602, 603, 604, 605, 606, and 607 corresponding to the service IDs 11, 12, 13, 14, 15, 16, and 17 are stored in the disk 315. Similarly, the attribute table of the printer controller shown in Fig. 40 is the attribute table (printer controller 510) corresponding to the service ID 21. The attribute tables of the printer controllers 511 and 512 corresponding to the service IDs 22 and 23 are stored in the disk 315.

[0219] Thereafter, at Step 3303 it is checked whether the designated attribute value can be acquired. This check is performed by acquiring the values of the object attribute table "list of attribute IDs acquired only by administrator" (attribute ID = 105) and checking whether the acquisition instructed attribute ID exists in the acquired values. If the attribute ID exists in the acquired values, the value cannot be acquired. Therefore, at Step 3305 an error answer packet is generated and transmitted to terminate the process. If the attribute ID does not exist, at Step 3304 the attribute table is searched by using the designated attribute ID to thereby acquire the type ID and attribute value corresponding to the attribute ID. At Step 3306 an answer packet is generated in accordance with the type ID and at Step 3307 it is transmitted to terminate the process. If it is judged at Step 3307 that the operation code is not "Get", then at Step 3308 it is checked whether the operation code is an attribute value write code "Set". If "Set", at Step 3309 the whole of the attribute table of the access object is acquired in accordance with the service ID. Thereafter, at Step 3310 it is checked whether the designated attribute value can be set. This check is performed by acquiring the values of the object attribute table "list of attribute IDs acquired only by administrator" (attribute ID = 104) and checking whether the acquisition instructed attribute ID exists in the acquired values. If the attribute ID exists in the acquired values, the value cannot be acquired. Therefore, at Step 3314 an error answer packet is generated and transmitted to terminate the process. If the attribute ID does not exist, at Step 3313 the attribute table is searched by using the designated attribute ID to thereby acquire the type ID and attribute value corresponding to the attribute ID. At Step 3312 the attribute value is set in accordance with the type ID and an answer packet notifying a setting success is generated. At Step 3313, this answer packet is transmitted to terminate the process. If the operation code is not "Set" at Step 3308, Step 3315 for the other process corresponding to the operation code to be described later is executed.

(Process of Inquiring Service ID List)

[0220] Fig. 49 is a flow chart illustrating a process that a client inquires a service list (service ID list) provided by MFP 201. Inquiry of th service list is performed by transmitting a proper command to the corr sponding sub address possessed by the supervisor and r ading the sub address - servic ID corresponding tabl shown in Fig. 9. The

flow chart shown in Fig. 49 corresponds to the details of Step 3315 (other operation cod proc ss) in the flow chart shown in Fig. 48. At Step 3401, it is checked whether the operation code is a service list acquisition code "List Service". If not, Step 3402 is executed for th other process corresponding to th operation code to b d scribed later to thereafter terminate the process. If it is judged at Step 3401 that th operation cod is "List Service", then at Step 3403 only the records corresponding to th connection type ID used for th inquiry are extract d from the sub address -service ID corresponding table and a list of records is formed. At Step 3403, each record in the list generated at Step 3403 is checked, and the record whose effective flag 804 is in the set state and the value of the effective user list 805, if any, is not equal to the value of the user ID used for the inquiry or the value of the invalid user list 806, if any, is equal to the value of the user ID used for the inquiry, is deleted from the list. An answer packet including the list of service IDs renewed at Step 3403 is generated at Step 3405, and transmitted at Step 3406.

(Process of Inquiring Sub Address)

[0221] Fig. 50 is a flow chart illustrating the process that client inquires sub address information necessary for receiving service provided by MFP 201, by designating the service ID. Inquiry of the sub address is performed by transmitting a proper command packet to the sub address possessed the supervisor 410 and reading the sub address - service ID corresponding table shown in Fig. 9. The command packet for inquiring the sub address contains a service ID as a parameter. The flow chart shown in Fig. 50 corresponds to the details of Step 3402 (other operation code process) in the flow chart shown in Fig. 49. At Step 3501, it is checked whether the operation code is a sub address acquisition code "Reserve". If not, Step 3503 is executed for the other process corresponding to the operation code to be described later to thereafter terminate the process. If it is judged at Step 3501 that the operation code is "Reserve", then at Step 3502 the sub address - service ID corresponding table is searched to obtain a corresponding record, by using as a search key the connection type ID used by the inquiry and the service ID designated in parameters. At Step 3504, it is checked for the searched record whether the effective flag is in the set state and whether the value of the user ID used by the inquiry exists in the effective user list if this list has a value, or whether the value of the user ID used by the inquiry exists in the invalid user list if this list has a value. If any one of these checks is not satisfied, it is judged that there is no access right (use right) of the designated service, and an error answer packet is generated at Step 3507 and transmitted at Step 3507 to thereafter terminate the process. If all of the checks are satisfied, an answer packet containing the sub address is generated at Step 3505 and transmitted at Step 3507 to thereafter terminate the process.

(Process of Inquiring Task Type Designating Service ID)

[0222] Fig. 51 is a flow chart illustrating a process of inquiring an optimum service ID for processing service of the designated type among services provided by MFP 201. Inquiry of a service ID of the designated service type is performed by transmitting a proper command packet to the sub address possessed the supervisor and reading the sub address - service ID corresponding table shown in Fig. 9 and the service ID - task type corresponding table shown in Fig. 11. The command packet for inquiring the sub address ID contains as parameters a task type for designating a service type and a combination (condition information) for limiting services. The condition information is described as a list of pairs of the attribute ID and value. The flow chart shown in Fig. 51 corresponds to the details of Step 3503 (other operation code process) in the flow chart shown in Fig. 50. At Step 3601, it is checked whether the operation code is a sub address acquisition code "Get Service". If not, Step 3603 is executed for the other process corresponding to the operation code to be described later to thereafter terminate the process. If it is judged at Step 3601 that the operation code is "Get Service", then at Step 3602 by using the connection type ID and sub address used by the inquiry and the sub address - service ID corresponding table, a list of service IDs having the connection type ID used by the inquiry is generated. At Step 3604 the records having the designated task type in the list are extracted by referring to the service ID - task type corresponding table, and a list of records is formed. At Step 3605 each record in the list formed at Step 3604 is checked, and the record whose effective flag 804 is in the set state and the value of the effective user list 805, if any, is not equal to the value of the user ID used for the inquiry or the value of the invalid user list 806, if any, is equal to the value of the user ID used for the inquiry, is deleted from the list. At Step 3609, the condition information contained in the parameter is compared to the attribute table of each manager corresponding to the service ID, and values other than those not matching the condition are deleted from the list. At Step 3606, the number of records in the list changed at Step 3605 is checked. If the number of records is 0, it is judged that there is no requested service, and an error answer packet is generated at Step 3611 and transmitted at Step 3613 to terminate the process. If the number of records is other than 0 at Step 3606, it is checked at Step 3607 whether the number of records is 1. If 1, an answer packet including th service ID is generated at Step 3612 and transmitted at Step 3613 to terminate the process. At Step 3608 each manager r turns the number of jobs under execution as its load state. A manager having a minimum load is s lected. An answer packet including the service ID corresponding to th selected manager is generated at Step 3610 and transmitted at Step 3613 to terminat the process.

[0223] Fig. 52 is a flow chart illustrating a certification process for th service ID (SID), user ID (UID) and password (PWD) to b executed by MFP 201. The flow chart shown in Fig. 52 corr sponds to the details of Step 3603 (other operation code process) in the flow chart shown in Fig. 51. At Step 36a01, it is checked whether the operation code is a user information acquisition cod "CheckID". If not, Step 36a12 is executed for th other process corresponding to the operation cod to be d scribed lat r to thereafter terminate the process.

[0224] At Step 36a02 the service ID, user ID and user password contained as parameters of the command are acquired.

[0225] At Step 36a03 the service ID - task type corresponding table (Fig. 11) is referred to by using the service ID to check whether there is the service ID designated by the user. If not, error answer information is generated at Step 36a10 and an error answer packet is transmitted at Step 36a11 to the transmission side to thereafter terminate the process.

[0226] If there is the service ID at Step 36a03, the access control table (Fig. 14) is referred to at Step 36a04 to acquire the security level corresponding to the service ID. If the security level is 0 at Step 36a04, without checking the user ID and user password a job permission answer packet is generated at Step 36a09 and transmitted at Step 36a11 to the transmission side.

[0227] If the security level is not 0 at Step 36a04, it is checked at Step 36a05 whether the security level is 1. If 1, without checking the user ID and user password a job permission answer packet is generated at Step 36a09 and transmitted at Step 36a11 to the transmission side.

[0228] If the security level is not 1 at Step 36a05, it is checked at Step 36a06 whether the security level is 2. If 2, it is checked at Step 36a08 whether the user ID contained in the packet and acquired at Step 36a02 exists in the user certification table (Fig. 13). If not contained, it is judged that there is no privilege and at Step 36a10 error answer information is generated at Step 36a10 and an error answer packet is transmitted at Step 36a11 to the transmission side. If the user ID is contained at Step 36a08, a job permission answer packet is generated at Step 36a09 and transmitted at Step 36a11 to the transmission side.

[0229] If the security level is not 2 at Step 36a06, it is checked at Step 36a07 whether a pair of the user ID and password acquired at Step 36a02 exists in the user certification table (Fig. 13). If not contained, it is judged that there is no privilege and at Step 36a10 error answer information is generated at Step 36a10 and an error answer packet is transmitted at Step 36a11 to the transmission side. If the pair of the user ID and password is contained at Step 36a07, a job permission answer packet is generated at Step 36a09 and transmitted at Step 36a11 to the transmission side.

(Structure of Job)

[0230] Fig. 53 shows the internal structure of a file (job file) storing the entity of a job and being managed by each manager. The job file name is stored in the file name 1502 of the job table (Fig. 20). This file structure also shows the internal structure of a file storing the entity of a job and being managed by each controller. This file name is stored in the file name 2903 of a job queue table (Fig. 42). The entity of a job is constituted of a plurality of consecutive pairs of an attribute ID 3701, an attribute size 3702 and an attribute value 3703. If a job contains a document, the attribute ID 3704, 3705, 3706 has a value representative of a document file, the attribute value size has the size of the document file, and the attribute value has the file name of the document file. If a job contains a binder, the attribute ID 3710, 3711, 3712 has a value representative of a binder file, the attribute value size has the size of the binder file, and the attribute value has the file name of the binder file. The job attribute includes: a job name; a job execution priority order; an event type; an event notice transmission destination; a job current status; job type related information; the number of copies for a print job; designation of a separation sheet for another job; designation of a recovery process in case of absence of media; and the like.

(Structure of Document)

[0231] Fig. 54 shows the internal structure of a document file possessed by each job file. The name of a document file is stored in the file name 1502 of a document table (Fig. 62). This file structure also shows the internal structure of a file storing the entity of a document and being managed by each controller. The entity of a document is constituted of a plurality of consecutive pairs of an attribute ID 37a01, an attribute size 37a02 and an attribute value 37a03. If a document contains data, the attribute ID 37a07, 37s08, 37a09 has a value representative of data, the attribute value size has the size of a file storing data, and the attribute value has the file name of the file. The document attribute includes: a data transmission process; a data format (PDL or the like); a data compression scheme; document type related information; and for a print document, designation of a paper fe d tray; designation of media such as paper; d signation of both-side print; designation of print quality; designation of print margin quantity and position; and the lik .

(Structure of Binder)

[0232] Fig. 55 shows the internal structure of a binder file possessed by each job file. The name of a binder file is stored in the file name 1502 of a binder table (Fig. 63). This file structure also shows the internal structure of a file storing the entity of a binder and being managed by each controller. The entity of a binder is constituted of a plurality of consecutive pairs of an attribute ID 37b01, an attribute size 37b02 and an attribute value 37b03. If a binder contains a document, the attribute ID 37b04, 37b05, 37b06, or 37b10, 37b11, 37b12 has a value representative of data, the attribute value size has the size of a file storing document data, and the attribute value has the file name of the file. The binder attribute includes: for example, for a print binder, designation of an output bin; finishing designation such as staples and punching holes, sorting designation and the like.

(Job Script Process of Each Manager)

[0233] Figs. 56 to 60 are flow charts illustrating the job script process to be executed by each manager. The job script is constituted of a series of command packets shown in Fig. 46, and defined as beginning with a "Job Start" operation code and ending in a "Job End" operation code. Each packet constituting the job script is issued to the sub address shown in the sub address - service ID corresponding table shown in Fig. 9, and distributed to each manager in accordance with the command packet process flow shown in Fig. 47. The flow charts shown in Fig. 56 to 60 illustrate a process that each manager processes a command packet and generate the job file, binder file, document file or data file shown in Figs. 53 to 55.

[0234] Referring to Fig. 56, at Step 3801 it is checked whether the operation code distributed to each manager is a supported operation code. This check is performed through comparison with the value of the attribute (attribute ID 101) "supported operation" in the attribute table of each manager. If the operation code is not supported, an error answer packet is generated and transmitted at Step 3811 to terminate the process. If the operation code is supported at Step 3801, it is checked at Step 3802 whether a job is presently executed. This check is performed by inspecting whether the job execution flag (flag to be set at Step 3806) is true. If this inspection indicates that the job execution flag is false and a job is not under execution, then it is checked at Step 3804 whether the operation code is "Job Start". If not, an error answer packet is generated and transmitted at Step 3816 to terminate the process. If "Job Start" at Step 3804, a job ID is assigned and added to the job table (Fig. 20) and a job file is newly formed at Step 3895.

Thereafter, at Step 3806 the job execution flag is set to true to terminate the command packet process. If the check at Step 3802 indicates that the job execution flag is true, it is checked at Step 3803 whether a binder process is presently executed. This check is performed by inspecting whether a binder execution flag (flag to be set at Step 38d03) is true. If this inspection indicates that the binder execution flag is true and the binder process is presently executed, then the flow advances to the binder process shown in Fig. 57. If the inspection indicates that the binder execution flag is false and the binder process is not presently executed, then it is checked at Step 3807 whether a document process is presently executed. This check is performed by inspecting whether a document execution flag (flag to be set at Step 38d06) is true. If this inspection indicates that the document execution flag is true and the document process is presently executed, then the flow advances to the document process shown in Fig. 58. If the inspection indicates that the document execution flag is false and the document process is not presently executed, then it is checked at Step 3803 whether the operation code is "Set Job". The operation code "Set Job" is used for notifying the manager that the parameter includes the attributes (attribute ID and attribute value) constituting the job. If the operation code of the job is "Set Job", an area is added to the job file at Step 3809, and at Step 3810 the attribute ID, attribute size and attribute value are written in the added area to terminate the process. If the check at Step 3808 indicates that the operation code is not "Set Job", the flow advances to the process shown in Fig. 59.

[0235] At Step 38a01 in Fig. 57, it is checked whether the operation code is "Set Binder". The operation code "Set Binder" is used for notifying the manager that the parameter includes the attributes (attribute ID and attribute value) constituting the binder. If the operation code of the job is "Set Binder", an area is added to the binder file at Step 38a02, and at Step 38a03 the attribute ID, attribute size and attribute value are written in the added area to terminate the process. If the check at Step 38a01 indicates that the operation code is not "Set Binder", it is checked at Step 38a04 whether the operation code is "Binder End". If "Binder End", a binder file generation process is executed at Step 38a05 to thereafter terminate the process, whereas if not, the other operation process is executed at Step 38a06.

[0236] At Step 38b01 in Fig. 58, it is checked whether the operation code is "Set Document". The operation code "Set Document" is used for notifying the manager that the parameter includes the attributes (attribute ID and attribute value) constituting the document. If the operation code of the job is "Set Document", an area is added to the document file at Step 38b02, and at Step 38b03 the attribute ID, attribute size and attribute value are written in the added area to terminate the process. If the check at Step 38b01 indicates that the operation code is not "Set Document", it is checked at Step 38b04 whether the operation code is "Document End". If "Document End", a document file generation process is executed at Step 38b05 to thereafter terminate the process, whereas if not, the flow advances to the process

shown in Fig. 60.

[0237] At Step 38c01 in Fig. 59, it is check d whether th operation code is "Binder Start". If th operation code is "Binder Start", a binder ID is assigned at Step 38c02 and an item is added to th binder tabl (Fig. 63) to newly form a binder file. Thereaft r, at St p 38c03 a binder ex cution flag is set to true to th reafter terminate th command packet process. If the operation code is not "Binder Start" at Step 38c01, it is checked at Step 38c04 whether the operation code is "Document Start". If "Document Start", at Step 38c05 a document ID is assigned and an item is added to the document table (Fig. 62) to newly form the document file. Thereafter, at Step 38c06 the document execution flag is set to true to thereafter terminate the command packet process. If the operation code is not "Document Start" at Step 38c04, it is checked at Step 38c07 whether the operation code is "Job End". If "Job End", a job generation completion process is executed at Step 38c08 to thereafter terminate the process. The job generation completion process includes various processes such as closing the job file, depending upon the manger type (print job, scan job, copy job, font, form overlay, log, color profile). If the check at Step 38c07 indicates that the operation code is not "Job End", the other operation process is executed at Step 38a09 to thereafter terminate the process.

[0238] At Step 38d01 in Fig. 60, it is checked whether the operation code is "Send". The operation code "Send" is used for notifying the manager that the parameter includes data constituting the document. If the operation code is "Send", a continuation flag input together with the command is checked. If the continuation flag is true, an area is added to the already present data file 37a13 at Step 38d03, and at Step 38d04 the parameter is written in the added area to thereafter terminate the process. If the continuation flag is false at Step 38d02, the data file 37a13 is newly generated at Step 38d06 and the parameter is written in the data file at Step 38d06. Thereafter, at Step 38d07, an area is added to the document file. The attribute ID 37a07 representative of the data, file name size 37a08 and newly formed file name 37a09 are written in the added area to thereafter terminate the process. If the operation code is not "Send" at Step 38d01, it is checked at Step 38d10 whether the operation code is "Send Request". The operation code "Send Request" is used for instructing the manager to transmit data, and includes a data transmission process as the parameter. If the operation code is "Send Request", a process dependent upon each manager is executed at Step 38d11 to thereafter terminate the process. The process at Step 38d11 includes, for the scan job manager, a process of instructing the scanner controller to scan an original in accordance with the attribute value in the job file, and transmitting obtained data by a designated method, for the font manager, a process of immediately transmitting font data designated by the attribute value in the job file by a designated method, and other processes. If the operation code is not "Send Request" at Step 38d10, the other operation code process is executed at Step 38d12 to thereafter terminate the process.

[0239] If the operation code is not "Set Job" at Step 3817 in Fig. 61, it is checked at Step 3820 whether operation code is "Send Request". The operation code "Send Request" is used for instructing the manager to transmit data, and includes a data transmission process as the parameter. If the operation code is "Send Request", a process dependent upon each manager is executed at Step 3821 to thereafter terminate the process. The process at Step 3821 includes, for the scan job manager, a process of instructing the scanner controller to scan an original in accordance with the attribute value in the job file, and transmitting obtained data by a designated method, for the font manager, a process of immediately transmitting font data designated by the attribute value in the job file by a designated method, and other processes. If the operation code is not "Send Request" at Step 3820, the other operation code process is executed at Step 3822 to thereafter terminate the process.

(Job Process of Print Job Manager)

[0240] Fig. 64 is a flow chart illustrating a job process to be executed by the print job mangers 501 to 509 shown in Fig. 5. The print job manager runs the task for always monitoring the job table operate. The print manager executes the job script process shown in Fig. 54 and a new item is added to the job table when the "Job Start" operation code is input. Upon detection of this new item, the monitoring task runs another task having a process shown in Fig. 64 to process the input job. First, at Step 3901 a job event handler is activated to process an event regarding the job. The job event handler is another task which operates in association with the job. The details of the operation are given later with reference to Fig. 65. Next, at Step 3902 a process of print data reception and PDL rasterizing is executed. Image data can therefore be obtained at Step 3902. At Step 3903, a job process using this image data is requested to the printer controller. The details of this process will be later given with reference to Fig. 67. At Step 3904 an account process for resources used by the job is executed. The details of this process will be later given with reference to Fig. 68. Lastly, at Step 3905 the first activated job event handler is terminated and the file and the like used by the job process are deleted, to thereafter terminate the job process by the print job manager.

(Job Event Handler Process)

[0241] Fig. 65 is a flow chart illustrating the process to be x cuted by th job vent handler. The job event handler is a diff rent task which is activated at the sam time when ach job manager starts the job process, and

monitors various events occurred in the devic . When an event associated with the job which activated the job event handler occurs, such as job status transition, error occurrenc , and job process completion, a notice process is executed for the event. When the job is completed, each job manager instructs to terminat the job v nt handler. This instruction is also detected as an event of the job vent handler. At Step 39a01, an event in th device is monitored, and when an event associated with th job occurs, th flow advances to n xt Step. At Step 39a02, it is checked from the job file whether the occurred event is registered as a notice object. If registered, at Step 39a03 the job file is read to acquired the transmission method and transmission destination. At Step 39a04 an event packet is generated and transmitted to the transmission destination. If the occurred event is not registered, the flow skips to Step 39a05 whereat it is checked whether the job event handler is instructed to be terminated. If instructed, the job event handler terminates its process, whereas if not, the flow returns to Step 39a01.

(Data Reception/PDL Rasterizing Process)

[0242] Fig. 66 is a flow chart illustrating the process of data reception and PDL rasterizing to be executed by the print job manager. At Step 39b01 it is checked whether the job file is added with an attribute representing the type of PDL (page description language) used for expressing data (document data), and after the type of PDL is determined, it is checked whether the PDL rasterizer (PDL rasterizer 417 or 418) can be used. When it becomes at Step 39b01 that the PDL rasterizer can be used, it is checked at Step 39b02 whether an attribute representing the data reception method is added to the job file. When the attribute representing the data reception method is added to the job file, the data reception method is checked at Step 39b03. If the data reception method is a method of accessing data externally from MFP 201 (such as client PC on the network), then at Step 39b04 a task of reading designated data is generated to access external data. Thereafter, at Step 39b05 the flow stands by until the data read starts. If it is judged at Step 39b03 that the data is in the job (in Fig. 61, data is received by the "Send" operation code), the flow stands by at Step 39b06 until the data reception starts. When the data read or reception starts at Step 39b05 or 39b06, data supply to the PDL rasterizer starts at Step 39b07. Thereafter, at Step 39b08 the print manager receives image data from the PDL rasterizer.

(Printer Controller Process)

[0243] Fig. is a flow chart illustrating a job process to be requested to the printer controller. At Step 39c01 a printer controller is determined. The print controller may be determined in advance from the attribute ID 2002 (job executing controller ID list) in the attribute table of each print job manager 501 to 507, and 508 or dynamically determined by reading the contents (attribute ID and attribute value in the job file shown in Fig. 53) of the print job file wherein the attribute ID 2002 (controller automatically selectable or not) of the print job manager 508 indicates that the controller can be automatically selected. In this case, if the attribute ID and attribute value in the job file designate a color print, the ink jet controller 512 (CID 23) is determined, whereas the attribute ID and attribute value designate the finisher, the LBP controller 510 (CID 21) is determined. When the printer controller is determined, at Step 39c02 image data is supplied to the printer controller and a job ID is received from the printer controller. At Step 39c03 the job ID and printer controller ID and the job ID received from the printer controller are written in the job request table (Fig. 21) as a record of the printer controller. Thereafter, at Step 39c04 the print job manager stands by until the job is completed at the printer controller. When a job completion is notified from the printer controller, the corresponding record is deleted from the job request table at Step 39c05. It is checked at Step 39c06 whether all the jobs requested by the printer controller are completed. If there is still a job at the printer controller, the flow returns to Step 39c06, whereas if all the requested jobs are completed, the record of the job is deleted from the job table (Fig. 20) at Step 39c07.

(Job Process by Print Job Manager)

[0244] At Steps 3901 and 3902 in Fig. 68, it is checked whether the PDL rasterizer can be used and whether the data reception method has been established. If established, the data reception method is confirmed at Step 3903. If external data is to be referred to, data access starts at Step 3904 and the flow stands by at Step 3905, whereas the data in the job is to be accessed, the flow stands by at Step 3906. When data read or data reception starts at Step 3905 or 3906, data supply to the PDL rasterizer starts at Step 3907. Thereafter, at Step 3908 image data is received from the PDL rasterizer, and at Step 3909 the printer controller to be used is determined. The print controller may be determined in advance from the attribute ID 2002 (job executing controller ID list) in the attribute table of the print manager 508 or dynamically determined by reading th contents (attribute ID and attribute valu in th job fil shown in Fig. 53) of the print job file wherein the attribut ID 2002 (controller automatically sel ctabl or not) of the print job manager 508 indicat s that th controller can b automatically s lected. In this cas , if the attribute ID and attribut value in the job file designate a color print, the ink jet controller 512 (CID 23) is det rmined, whereas th attribut ID and

attribute value designat the finish r, th LBP controll r 510 (CID 21) is d termined. When the printer controller is determined, at Step 3910 imag data is supplied to th printer controller and a job ID is received from th printer controller. At Step 3911 the job ID and printer controller ID and the job ID received from the printer controller are written in th job requ st table (Fig. 21) as a record of the printer controller. Thereafter, at Step 3912 the print job manager stands by until the job is completed at the printer controller. When a job completion is notified from the printer controller, the corresponding record is deleted from the job request table at Step 3913. It is checked at Step 3914 whether all the jobs requested by the printer controller are completed. If there is still a job at the printer controller, the flow returns to Step 3912, whereas if all the requested jobs are completed, in accordance with the count data format table (Fig. 116) of UID or AID of the current job to be charged, the current job is counted up in the count data table (Fig. 115) at Step 3921, and the record of the job is deleted from the job table (Fig. 20) at Step 3915. At the same time, an event transmission process shown in Fig. 77 is executed. At Step 3916, the job file is checked, and it is checked at Step 3917 whether there is an attribute value instructing the event transmission for the job completion. If not, the process is terminated, whereas if there is the attribute, this attribute is read to acquire the transmission method and transmission destination at Step 3918. At Step 3919 an event transmission packet is generated to transmit the event to the transmission destination by using the designated transmission method. At Step 3920 the completion process such as deleting the job file or data file is executed to terminate the job process.

(Job Process by Scan Job Manager)

[0245] Fig. 69 is a flow chart illustrating a job process to be executed by the scan job manger 419. The scan job manager starts the job process after the job is issued. The scan job manager therefore starts the job process shown in Fig. 69 as the job completion process at Step 3815 shown in Fig. 61. First, at Step 4001, a job event handler is activated which executes an event process associated with the job. The job event handler is another task which operates in association with the job. The details of the operation are given later with reference to Fig. 65. Next, at Step 4002 the job process is requested to the scan controller. The details thereof will be later given with reference to Figs. 70 and 71. At Step 4003 a transmission process for the data obtained by scanning is executed. The details thereof will be later given with reference to Fig. 72. At Step 4004 the account process for resources used by the job is executed. The details thereof will be later given with reference to Fig. 68. Lastly, at Step 4005 the first activated job event handler is terminated and the file and the like used by the job process are deleted, to thereafter terminate the job process by the scan job manager.

(Scanner Controller Process)

[0246] Fig. 70 is a flow chart illustrating the job process to be requested to the scanner controller. At Step 40a01 the job is issued to the scanner controller to receive the job ID. At Step 40a02 the job ID and scanner controller ID and the job ID received from the scanner controller 420 are written in the job request table (Fig. 21). At Step 40103 a job completion at the scanner controller 420 is waited for, and when a job completion is notified from the scanner controller 420, the scanned image data is received from the scanner controller 420. At Step 40a04, the corresponding record of the job is deleted from the job request table (Fig. 21). At Step 40a05 the corresponding record of the job is deleted from the job table (Fig. 20).

(Internal Process by Scanner Controller)

[0247] Fig. 71 is a flow chart illustrating a process that the scanner controller 420 processes a scan job requested by the scan job manager 419. First, at Step 40b01, the scanner controller to which the job was requested checks the type of an original to be scanned, by using a sensor of the scanner engine. The type of an original capable of being checked includes various originals such as a color original, a monochrome original, an ozalid original, a text original, an image original, and an original with a mixture of text and image. It also checks the setting state of prescan designation. The prescan may be set as the status of the device itself or when a job is issued. After the original type and prescan setting are completed, at Step 40b02 the attribute of a document file is read and it is checked whether there are the corresponding original type and prescan setting. If there are the corresponding original type and prescan setting at Step 40b02, the flow advances to Step 40b03 whereat the attribute of the document file is read and a document type (resolution, image type and the like) to be generated after scanning is added to a generated data list. At Step 40b04 it is checked whether there is another designation of a document. If there is another designation, the flow returns to Step 40b02, whereas if not, the flow advances to Step 40b05. If there are not corresponding original typ and prescan designation at Step 40b02, the flow skips to Step 40b05. At Step 40b05 the generat d data list is checked to determine a scan condition. In this case, after the generated data list is checked, a scan operation is performed at the maximum resolution of the device, at the maximum resolution requ sted in the list, or by a multi-value image and thereaft r th data type is converted to th reby r duce th number of scan operations. At Step

40b06 an actual scan operation is performed. At Step 40b07 data of the type corresponding to th generated data list is generated. Next, at Step 40b08 it is checked whether all the data in the generated data list has been generated. If desired data can be obtained by converting the data obtain d by on scan operation, the flow returns to Step 40b07, th flow returns to Step 40b07 to generat the d sired data. If it is necessary to ex cut a further scan operation, the flow returns to Step 40b05. If it is judged that all th data in th g nerated data list has been generated, th flow advances to Step 40b09 whereat it is checked whether a further scan operation is to be continued. The condition of continuing the scan operation includes the case wherein the prescan setting is on and a main scan operation is to be performed, the case wherein a plurality of originals are placed on an original support and the scan operation for the next original is to be performed, and other cases. If it is judged that the scan operation is necessary to be continued, the flow returns to Step 40b01, whereas if not, the completion process such as discarding various data generated during the process is discarded to thereafter terminate a series of processes.

(Data Transmission Process)

[0248] Fig. 72 is a flow chart illustrating a data transmission process after scanning. At Step 40c01 an attribute indicating the data transmission process is searched from the attributes of the job. If the data transmission process is a process of transmitting data as a script, at Step 40c02 the data together with the other attribute information is transmitted as a script. The details of the data transmission process at the device are shown in Fig. 62. If the data transmission process is a process of transmitting reference information of data, at Step 40c02 the data is stored in the device and the reference information of the data together with other attribute information is transmitted as a script.

(Job Process of Copy Job Manager)

[0249] Fig. 73 is a flow chart illustrating a job process to be executed by the copy job mangers 601 to 608. The copy job manager starts the job process after the job is issued. The copy job manager therefore starts the job process shown in Fig. 73 as the job completion process at Step 3815 shown in Fig. 56. First, at Step 4101, a job event handler is activated which executes an event process associated with the job. The job event handler is another task which operates in association with the job. The details of the operation are given later with reference to Fig. 65. Next, at Step 4102 the job process is requested to the scan controller. The details thereof will be later given with reference to Figs. 70 and 71. Since image data is obtained at Step 4102, the job process is requested to the print controller by using th image data at Step 4103. The details thereof will be later given with reference to Fig. 67. At Step 4104 the account process for resources used by the job is executed. The details thereof will be later given with reference to Fig. 68. Lastly, at Step 4105 the first activated job event handler is terminated and the file and the like used by the job process are deleted, to thereafter terminate the job process by the copy job manager.

(Job Process - Download)

[0250] Fig. 74 is a flow chart illustrating the data download process in the job process to be executed by the font manager 413, form overlay manager 414, log manager 415 and color profile manager 416. The job to be executed by each of these managers is download and upload of data managed by each manager. Management of reference and deletion of data managed by each manager is performed by issuing a command packet to the sub address managed by the supervisor 410 and accessing the attribute table of each manager as shown in Fig. 48. After the job is issued, each manager starts the job process regarding data download. Therefore, each manager starts the job process regarding the download shown in Fig. 74 as the job completion process at Step 3815 shown in Fig. 56. At Step 4201, the job file (Fig. 56) is scanned to check whether there is an attribute regarding the data reception process. If not, it is judged that this job file is associated with upload and that the process shown in Fig. 75 has already been executed, and the completion process is executed at Step 4208. In the completion process at Step 4208, the job file is deleted. If there is an attribute regarding the data reception process at Step 4201, then at Step 4202 the data reception process is checked. If the data reception process is contained in the job (in Fig. 69, data is received by the operation code "Send"), it means that the data has already been received so that the received data is stored as a file at Step 4205. If the data reception process is used for external data of the device, the designated external source is accessed at Step 4203 to acquire the data, and at Step 4205 the acquired data is stored as a file. The file information stored at Step 4205 is registered by writing a new record in the management table managed by each manager (font table (Fig. 28) for the font manager 413, form overlay table (Fig. 31) for the font overlay manager 414, log table (Fig. 34) for the log manager 415, and color profile table (Fig. 39) for the color profile manager 416). At Step 4207 the completion process such as deleting the job file, data file and the like is executed to thereafter terminate the process.

(Job Process - Upload)

[0251] Fig. 75 is a flow chart illustrating the data upload process in th job process to be ex cut d by the font manager 413, form overlay manager 414, log manag r 415 and color profil manager 416. When the op ration code "S nd Request" constituting the job script is issued, each manager starts the job process regarding data upload. Therefore, each manager starts the job process regarding the upload shown in Fig. 75 as the job completion process at Step 3821 shown in Fig. 54. At Step 4301, the job fil (Fig. 53) is scanned to check whether there is an attribute regarding the data transmission process. If the data transmission process is a process of transmitting data as a script at Step 4301 (NO), the data designated by the job together with other attribute information is transmitted as a script. The details of the data transmission process at a device are shown in Fig. 78. If there is a designation of transmission of data reference at Step 4301, reference data of the data designated by the job together with other attribute information is transmitted as a script.

(Job Management by Each Manager)

[0252] Fig. 76 is a flow chart illustrating a process to be executed when a client instructs an operation (job deletion) of a job managed by each of the print managers 501 to 509, scan job manager 419 and copy job managers 601 to 608 of MFP 201. An operation of a job managed by each manager is performed by transmitting a proper command packet to the sub address possessed by the supervisor. The parameters of a job management command packet include the service ID and object job ID for identifying a subject job manager. The command packet transferred from the client to MFP 201 is processed in accordance with the flow chart shown in fig. 47 and supplied to the supervisor 410. The flow chart shown in Fig. 76 shows the details of Step 3603 (other operation code process) in the flow chart shown in Fig. 77. At Step 4401 the supervisor 410 checks whether the operation code is an operation code "Cancel Job" If not, the other process corresponding to the operation code is executed at Step 4409 to thereafter terminate the process. If the operation code is the operation code "Cancel Job" at Step 4401, then at Step 4402 in accordance with the service ID designated in the parameter, the parameter is sent to the manager corresponding to the service ID. At Step 4403, the manager searches the designated job ID from the job request table managed by the manager. If the designated job ID does not exist in the job request table at Step 4404, it is judged that the job has already been processed by the controller, and at Step 4410 the corresponding record is deleted from the job table and at Step 4411 an answer packet is generated and transmitted to thereafter terminate the process. If the designated job ID exists in the job request table at Step 4404, then acquired at Step 4405 are the job ID of the controller corresponding to the designated job ID and the controller ID of the controller which executes the job. At Step 4406 the controller corresponding to the controller ID is instructed to delete the job, by designating the job ID. At Step 4407 an execution result by the controller is waited for. If the execution result is a failure, at Step 4408 an error answer packet is generated and transmitted to thereafter terminate the process. If the execution result is success at Step 4407, then at Step 4408 the corresponding record is deleted from the job request table, and at Step 4403 the job request table is searched to again check whether there is another request to the controller.

(Event Transmission)

[0253] Fig. 77 is a flow chart illustrating an event transmission process to be executed at each manager. Each manager has the event set table shown in Fig. 16 as the value of the attribute table of the manager. As described with reference to Fig. 16, this table is written with the connection type and transmission destination for the transmission of an event when it occurs. When an event occurs, each manager recognizes the event ID of the event. Thereafter, at Step 4501 it is checked from the event set table whether the event ID is being registered. At Step 4502 if even one event ID is not being registered, the process is terminated. Acquired at Step 4503 from the first record are the connection type and transmission destination of the event for transmission thereof. At Step 4504 an event transmission packet is generated. Added to this packet are a parameter defined for each event ID and a parameter matching the format for each event ID registered in the event format table (Fig. 17). At Step 4505 the event transmission packet is transmitted to the transmission destination having the connection type acquired at Step 4503. It is checked at Step 4506 whether Steps 4503 to 4505 are repeated for all the records having the event IDs. If not, the flow returns to Step 4503, whereas all the records have been processes, the process is terminated.

(Data Script Transmission from MFP)

[0254] Fig. 78 is a flow chart illustrating a process to be executed by MFP 201 for transmitting data as a script which is a series of command packets. This flow chart is used at Step 4008 for transmitting image data obtained by the scan job and at Step 4303 for transmitting font data. At Step 4601 a packet including th attribute of data is generated and transmitted. If necessary, Step 4601 is repeated to transmit a plurality of attribut s. At Step 4602 data to be transmitted is acquired. The command packet has the structure shown in Fig. 46. Since th size of a parameter capable of being transmitted is limited, at Step 4603 th length of data is checked. If the length of data is in excess of the data

limit length (624 k bytes), at Step 4606 th data is cut at the data limit length and a command packet added with th obtained data as a parameter is generat d and transmitted. This command packet is set with th operation cod "Send" and the tru continuation flag. At Step 4608 th remaining cut data is acquired and the data length thereof is again checked at Step 4603. If it is judged at Step 4603 that th data length is within the data limit length, th n at Step 4604 a command packet added with the data as a param ter is generated and transmitted. This command pack t is s t with the operation code "Send" and the false continuation flag. At Step 4605 a command packet including the remaining attribute is generated and transmitted. If necessary, Step 4601 is repeated to transmit a plurality of attributes. s

(Hardware Structure of Client PC)

[0255] Fig. 79 shows the hardware (controller) structure common to all of the client PCs 202, 203, 204 and 205. In the controller, a CPU 6001 is connected via a bus 6010 to a memory (RAM) 6002, a display 6003 such as a CRT, a pointing device 6004 such as a keyboard and a mouse, a ROM 6008, and a disk 6009. Various programs and data shown in Fig. 108 are stored in the disk 6009 (storage medium) such as a hard disk and a floppy disk, and they are sequentially read into the memory (RAM) 6002 when necessary, and executed by CPU 6001. The disk 6002 may be a removable disk or a built-in disk of the client PC. The programs shown in Fig. 108 may be downloaded from other client PCs and MFP 201 via the network interface cable (10 BASE-T) 208, IEEE 1394 interface cable 206, and IEEE 1284 interface cable 207 and stored in the disk 6009. The hardware shown in Fig. 109 constitutes a general client PC. CPU 6001 supplies data to the display 6003 to display it, and reads data from the pointing device 6004 to receive a user instruction.

[0256] The bus 6010 is connected to a network interface connector 6005, an IEEE 1394 interface connector 6006 and an IEEE 1284 interface connector 6007 and to the network interface cable (10 BASE-T) 208, IEEE 1394 interface cable 207 and IEEE 1284 interface cable 207 shown in Fig. 2. CPU reads/writes data via these interface to communicate with other devices.

(Software Structure of Client PC)

[0257] Fig. 80 shows a portion of the software (control program) structure of the client PCs 202, 203, 204 and 205 using MFP 201. The software (control programs) and data used by the client PC are stored in the disk 6009, as shown in Fig. 108. Reference numeral 501 represents a user interface via which drives and utilities 505 to 514 display data possessed by MFP 201 on the display 6003. A database (disk 6009) 502 stores currently used data of MFP 201. When th client PC is accessed to MFP 201, all data of the device is acquired by a device information acquisition unit 503 and stored in the database 502. A rule database (disk 6009) 504 stores rule information in each attribute table possessed by MFP 201, the rule information including the meaning of each attribute, a data type of each attribute ID, a parameter format defined by each event ID, the meaning of a task type, a sub address of the supervisor, and the like. The drivers and utilities 505 to 514 operate in accordance with the contents in the rule database 504 and device information database 502. A printer driver 5050 generates a print job script in response to an instruction from an application program running on the client PC. A scanner driver 506 generates a scan job script in response to an instruction from an application program running on the client PC. A copy driver 507 generates a copy job script in response to an instruction from an application program running on the client PC. A font management utility 508 generates a job for downloading and uploading font data and a command for managing font data. A form overlay management utility 509 generates a job for downloading and uploading form overlay data and a command for managing font overlay data. A log management utility 510 generates a job for downloading and uploading log data and a command for managing log data. A color profile management utility 511 generates a job for downloading and uploading color profile data and a command for managing color profile data. A job management utility 512 generates a command for deletion, temporary stop, execution resume and the like of a print job, a scan job and a copy job. A device management utility 513 generates a command for acquiring the statuses of the printer controller and scanner controller. An account management utility 514 generates a command for acquiring account data.

[0258] A generator 515 generates a command packet in accordance with a command generated by each of the drives and utilities 505 to 514. The generated command packet is transmitted to MFP 201 by using each of transport process modules 517, 519, and 521. The generator 515 analyzes an answer packet or event packet supplied from each of the transport process modules 517, 519, and 521, and distributes it to a proper driver or utility. An SBP-2 process module 517 corresponds to the transport layer of IEEE 1394. Reference numeral 519 represents a TCP/IP and UDP/IP process module. An IEEE 1284.4 process module 521 corresponds to the transport layer of IEEE 1284. Reference numeral 518 represents an interface to the physical layer of IEEE 1394. Reference numeral 520 represents a network interface. Reference numeral 522 represents an interface to th physical lay r of IEEE 1284. Fig. 80 also shows the internal structure of the user interfac manager 405 in the software (control program) structure (Fig. 4) of MFP 201. In the case of the user interface manager 405, th SBP-2 process modul 517, TCP/IP and UDP/IP process module 519, IEEE 1284.4

process module 521, network int rfac 518, network int rface 520 and IEEE 1284 interfac 522 respectively shown in Fig. 64 are not used, but th gen rator 515 is directly connected to th interpreter 409 shown in Fig. 4. With this connection, a command packet, answer packet, and v n pack t ar transferred. This direct connection does not exist in the softwar (control program) structure of the client PCs 202, 203, 204 and 205.

(Packet Generation and Transmission Process)

[0259] Fig. 81 is a flow chart illustrating a process to be executed by the generator 515 for generating a command packet shown in Fig. 46 upon reception of a command or job script from each of the drivers and utilities 505 to 514 and transmitting the command packet to MFP 201. It is assumed that prior to this process, a proper sub address of the transmission destination at MFP is already connected. Information on which sub address is connected is acquired by the process of acquiring the device information shown in Fig. 82. The job script is defined by a series of commands. If a process object is a job script, Steps 4701 to 4706 are repeated until all commands are processed. In the following description, issuing a job script means the processes for each command from Step 4701 to Step 4707. At Step 4701 the length of data to be transmitted with a command is checked. If the length is in excess of the limit length (64 K bytes) of the parameter, then at Step 4702 the data is cut at the limit length. For the cut data, at Step 4703 the continuation flag is set as true and a packet including the operation code corresponding to the command is generated and at Step 4704 it is transmitted. If the data length is within the limit length of the parameter at Step 4701, then at Step 4705 the continuation flag is set as false and a packet including the operation code corresponding to the command is generated and at Step 4706 it is transmitted.

(Information Acquisition and Software Automatic

Configuration at Client PC)

[0260] Fig. 82 is a flow chart illustrating a process to be executed by the device information acquisition unit 503 shown in Fig. 80. The device information acquisition unit 503 executes the process shown in Fig. 82 immediately after connected to MFP 201, acquires device information and stores it in the device information database (disk 6009) 502. This process is again executed when an event of a configuration change is supplied from the device. At Step 4801 the client PC is connected to MFP 201. Specifically, the client PCs 202 and 203 connected to the Ethernet interface 208 connects MFP 201 by designating the IP address and port number and outputs IP packet data. The client PC 204 connected to the IEEE 1394 interface 206 connects MFP 201 by designating the node ID and LUN (logical unit number) and outputs SBP-2 packet data. The client PC 205 connected to the IEEE 1284 interface 207 connects MFP 201 by designating the socket number and outputs IEEE 1284.4 packet data. As the sub address of the connection destination, the sub address of the supervisor predefined for each connection type used for the connection is used. This predefined value is acquired from the rule information database (disk 6009) 504. At Step 4802 the value of the attribute ID 100 (attribute ID list) of the attribute table of the supervisor shown in Fig. 7 is acquired. The attribute value is acquired by generating an attribute value acquisition command "Get" by using the service ID 0 and attribute ID of the supervisor as the parameters and by issuing the command to the generator 515. The generator 515 executes the process shown in Fig. 65 to transmit the attribute value acquisition command packet to MFP 201. Upon reception of the command packet, MFP 201 executes the processes shown in Figs. 47 and 48 to return the attribute value of the designated attribute ID to the client PC. The client PC makes the answer packet be analyzed by the generator and supplies the analyzed result to the device information acquisition unit. The attributes of the attribute ID 100 correspond to the list of all attribute IDs of the attribute table of the supervisor. At Step 4803 the attribute value is acquired by designating the attribute ID. At Step 4804 the attribute value is acquired until those of all attribute Ids are acquired. The acquired attribute value together with the attribute ID is stored in the device information database 502. With the above Steps, the whole of the attribute table (Fig. 7) of the supervisor is stored in the device information database 502.

[0261] At Step 4805 the service ID list (SID - task type table shown in Fig. 11) is acquired from the attribute table stored in the device information database (disk 6009) 502. The service ID is acquired by generating a service ID list inquiry command (list service) and issuing it to the generator 515. At this time, MFP 201 executes the processes shown in Figs. 47 to 49. At Steps 4806 to 4811, information on each manager is acquired for each service ID acquired at Step 4805. At Step 4806 the service ID 1 (print job manager 501) is acquired from the list shown in Fig. 11, the service ID 1 being the first service ID in the list excepting the service ID (service ID 0) of the supervisor. At Step 4807 the sub address corresponding to the service ID is acquired. The sub address is acquired by generating a sub address acquisition command "Reserve" as a parameter and issuing it to the generator 515. At this time, MFP 201 executes the processes shown in Figs. 47 to 50. The acquired sub address is stor d in th devic information database 502. At Step 4808 the value (attribut ID list) of the attribute ID 0 of th attribut table of each manager is acquired. The attribute value is acquir d by generating an attribut valu acquisition command "Get" by d signating the servic ID and

attribute ID corresponding to each manager and issuing it to th generator 515. At Step 4809 the attribute value is acquired by designating th attribut ID, and at Step 4810 th attribute value is acquired until those of all attribut IDs are acquired. The acquired attribute value together with th attribute ID is stored in the d vice information databas 502. It is checked at Step 4811 wh ther the service ID is the last service ID in the service ID list. If not, at Step 4811 the next service ID is acquired from the service ID list to repeat the process starting from Step 4807. At Step 4811 the attribute values together with the attribute IDs are stored in the device information database 502, the attribute values corresponding to all service IDs in the service ID list (of the print managers 501 to 509, scan job manager 419, copy managers 601 to 608, font manager 413, form overlay manager 414, log manager 415, color profile manager 416, printer controllers 510 to 512 and scanner controller 420). At Step 4813, in accordance with the device information stored in the device information database (disk 6009) 502, user interfaces for the drivers and utilities (control programs) 505 to 514 are automatically configured. The automatic configuration Step 4813 includes updating the user interface to change the display of a setting screen (user interface) in accordance with each of the drivers and utilities. For example, in the case of the user interface of the printer driver, the display screen on the display 6003 such as shown in Figs. 112 and 113 is changed as in the following. The contents to be changed include a PDL list supported in accordance with the attribute value of the attribute ID 1101 of each print job manager 501 to 509, a color print availability determined by the attribute ID 1102, the type of finishing supported in accordance with the attribute value of the attribute ID 1103, a maximum resolution settable in accordance with the attribute value of the attribute ID 1104, and a minimum resolution settable in accordance with the attribute value of the attribute ID 1105. Similarly, the display of the user interface of each of the other drives 506 and 507 and utilities 508 to 514 is changed in accordance with the corresponding attribute value. In addition, an icon of the print manager, copy manager and the like for each of the drivers and utilities is distinguishably displayed. Lastly, at Step 4814 the connection of the supervisor 410 is released to terminate the process.

(Issuing Job by Designating Task Type)

[0262] Fig. 83 is a flow chart illustrating a process to be executed when each application utility issues a job script by designating a task type. Issuing a job by designating a service ID is performed by searching the device information database 502 by using the service ID as a search key and by transmitting a proper job script to the acquired sub address. If a user instructs to designate only the task type, it is necessary to request MFP 201 to introduce the service ID to be used. Fig. 83 illustrates this process. At Step 4901 an attribute value acquisition command for acquiring a service ID by designating a task type is generated and the command is issued to the generator 515. At this time, MFP 201 executes the processes shown in Figs. 47 to 51. At Step 4902 in accordance with the service ID acquired at Step 4901, the device information database 502 is searched and a job script is transmitted to the acquired sub address.

(Event Structure)

[0263] Fig. 84 shows the structure of an event to be transmitted from MFP 201 to the client PC. An event packet has the same structure as that of the command packet shown in Fig. 46. The event structure shown in Fig. 84 shows the structure of a packet parameter 3110. Reference numeral 5001 represents an event ID indicating the type of the event. Reference numeral 5002 represents parameter data defined for each event ID. The format of parameter data is stored in advance in the rule information database 504. Reference numeral 5003 represents parameter data whose format is determined by the device for each event ID. The format of this parameter data is stored as the event format table (Fig. 17) in the device information database 502, by executing the process shown in Fig. 82.

(Event Process)

[0264] Fig. 85 is a flow chart illustrating a process to be executed when each of the drivers and utilities at the client PC receives an event from MFP 201. Each of the drivers and utilities registers in advance a desired event in the generator 515 by using the event ID as a key. When an event is issued from MFP 201 to the client PC, the generator 515 distributes the event to each of the registered drivers and utilities. The flow chart of Fig. 85 illustrates the process to be executed after each of the drivers and utilities receives the event. At Step 5101 in accordance with the format information acquired from the rule information database 504, the rule parameter data 5002 is analyzed. At Step 5102, by using the event ID (5001) as a search key, an event format 1302 corresponding to the event ID is acquired from the event format table (Fig. 17). At Step 5103 in accordance with the acquired event format, the event format dependent upon each device is analyzed, the event format including the attribute ID 676 : paper size, ID 756 : paper type, ID 666 : toner type, ID 698 : ink type, and ID 600 : cover position. At Step 5104, th analyzed parameters and event IDs (event ID 200 : no paper, ID 399 : no toner, ID 432 : no ink, and ID 234 : cover open of MFP) are process d to display a user interface corr sponding to each v nt on the display 6003 (such as no paper, cover open, and no toner).

(Log Process)

[0265] Fig. 86 is a flow chart illustrating a process to be executed when the log management utility 510 acquires and process a log poss ssed by MFP 201. At St p 5201, log data is acquired by generating a log data acquisition job script and transmitting it to MFP 201. At this time, MFP 201 executes the processes shown in Figs. 47, 56 and 75 to supply the log data to the client PC. For example, the log data "12345,4,4. 23, "OK"" on 98/1/3 1:23 of the log format ID 1 indicates that the user ID issued the job to the print job manage having the service ID 1 is 12345, the number of output paper sheets is 4, the amount of used toner is 1.23, and the job completion state is OK. At Step 5202 the log format table (Fig. 36) is acquired from the device information database 502. At Step 5203 the log format ID 2502 at the top of each record of the log data is acquired, and in accordance with this value, the log format 2502 is acquired from the log format table (Fig. 36). For example, the format "1 : 701,1 : 565,1 : 765,1 : 777" of the log format ID 1 shows the user ID issued the job to the print manager having the service ID 1, the number of output paper sheets, the amount of used toner, and the job completion state. The format "11 : 701,11 : 565,11 : 765,11 : 777" of the log format ID 2 shows the user ID issued the job to the print manager having the service ID 11, the number of output paper sheets, the amount of used toner, and the job completion state. At Step 5204 the log data is analyzed in accordance with the log format 2502 and the analyzed data and a log occurrence time 2402 are processed (log sorting or the like). At Step 5205 it is checked whether the log data of each record has been analyzed. If not, the process from Step 5203 are repeated, whereas if all the records have been analyzed, the process is terminated.

(Acquisition and Process for Account Information)

[0266] Fig. 87 is a flow chart illustrating a process to be executed when the account management utility 514 acquires and processes account data possessed by MFP 201. The account data is represented by count data for each UID or AID possessed by each manager. The count data is stored in the attribute table (Figs. 7, 18, 22, 24, 26, 29, 32, 37, 40 and 44) as the value of the attribute ID 401, and the values are represented as a list of integers for each UID or AID. The meaning of each integer is represented as a value of the attribute (attribute ID 402) of the count data format in the attribute table of each manager, and the values are represented as a list of attribute IDs for each UID or AID. The list of count data and the list of count data formats are in correspondence with each other by the sequential order in each list. For example, the third value of the count data means the information of the third attribute ID of the count data format having the same UID or AID. Fig. 87 illustrates the process of acquiring and processing the count data possessed by each manager. At Step 5301, the value (count data value) of the attribute ID 401 is acquired by designating the object service ID of the manager. For example, the values (45, 78, 34, 13) of the counter of the user ID (or account ID) 2003 of the attribute ID 402 indicate the numbers of prints having the paper size designated by the cont data format of the user ID (or account ID) 2003 of the attribute ID 402. The value of the attribute ID 401 is acquired by generating an attribute value acquisition command by using the service ID and attribute ID as parameters and issuing it to the generator 515. At Step 5302 by designating the same service ID, the value (count data format value) of the user ID (or account ID) 2003 of the attribute ID 402 is acquired. For example, the attribute value 565 of the user ID (or account ID) 2003 of the attribute ID 402 indicates the number of prints having the paper size of A2, the attribute value 537 indicates the number of prints having the paper size of A3, the attribute value 545 indicates the number of prints having the paper size of A4, and the attribute value 523 indicates the number of prints having the paper size of A5. This value may be acquired from the device information database 502. At Step 5303 the count data is analyzed by using the acquired count data format. At Step 5304 by using the analyzed count data, the account data is processed and generated, for example, for each service ID, each user ID, each account ID, or each department, to thereafter terminate the process.

(Issue of Print Job and Data Download Job)

[0267] Fig. 88 is a flow chart illustrating a process of: issuing a print job by the printer driver 505; issuing a font data download job script by the font management utility 508; issuing a form overlay data download job script by the font overlay utility 509; issuing a log data download job script by the log management utility 510; and issuing a color profile data download job script by the color profile management utility 511. The process by each software (control program) is common for all control programs, and the document data to be printed and the data (font data, form data, color profile data and log data) to be downloaded are described simply as "data" in the description for Figs. 88 and following figures. When a job is issued, the data to be printed or downloaded is designated together with a plurality of attribute values to be set in the job script. First, at Step 5401 device information is checked. The details of this process will be later described with reference to Fig. 89. Next, at Step 5402 the device status is checked. The details of this process will b later described with reference to Fig. 90. After th ch ck processes at Steps 5401 and 5402, a job proc ss with a user management function is executed at Step 5403. The details of this process will b later described with reference to Fig. 91. If the job proc ss with the user management function is not executed, this Step may be omitted. At Step 5404, a proc ss of determining the data transmission process is execut d. Th details of this

process will be later described with reference to Fig. 92. Next, at Step 5405, an account check process is executed. The details of this process will b later described with reference to Fig. 93. Lastly, issued at Step 5406 are the job scripts generated by the above St ps and other job scripts necessary for the print job. Each manager of MFP 201 received the job script executes the process shown in Fig. 56, 61, 64, 65, 66, 67 or 68 (for print job manager) and the process shown in Fig. 56, 61 or 74 (for font manager, form overlay manager, log manager, and color profile manager) to thereby execute the designated job.

(Check Process for Device Information)

[0268] Fig. 89 is a flow chart illustrating a device information check process to be executed when a job is issued. At Step 54a01 device information is acquired by accessing the device information database 502. At Step 54a02 by referring to the attribute table possessed by each manager to which data is issued (e.g., print manager to be designated, if the document data is to be printed), it is checked whether the designated attribute values are in the range of attribute values set in the attribute table. If even one attribute value is not in the range, at Step 54a05 the job issue rejection process is executed such as displaying an error dialog on the user interface to thereafter terminate the process. If it is judged at Step 54a02 that all the attributes are in the range of attribute values in the attribute table possessed by the manager, then it is checked at Step 54a03 whether an inhibited attribute (attribute ID 801 to ID 805) exists in the attribute table of the manager. If the attribute table of the manager possesses the inhibited attribute, then at Step 54a04 it is checked whether the designated attribute of the job is paired with each inhibited attribute in the attribute table of the manager. If the attribute is paired with the inhibited attribute, then at Step 54a05 the job issue refection process is executed to thereafter terminate the process.

(Status Check Process)

[0269] Fig. 90 is a flow chart illustrating a status check process to be executed before a job issue. At Step 54a01, a status attribute is acquired by transmitting the "Get" command together with the service ID and attribute ID of the manager as parameters to MFP 201. MFP 201 analyzes the "Get" command in the process shown in Fig. 48 and returns the value of the attribute ID 106. At Step 54a02 it is checked from the attribute ID 106 whether the current status is normal or abnormal. If normal (attribute value = 0), the job issue process continues, whereas if not normal (attribute value = 0) at Step 54e02, then at Step 54e03 it is checked from the attribute ID 106 whether the current status is "normal with restriction (attribute value = 1)" or "abnormal (attribute value = 2)". If "abnormal (attribute value = 2)", at Step 54e07 the reason why the job service is not allowed is acquired by acquiring the value of the attribute ID 108 of the manager connected to MFP 201. At Step 54e08 the "reason why the job service is not currently available" is displayed to thereafter terminate the process. If the current status is "normal with restriction (attribute value = 1)" at Step 54e03, then at Step 54e04 an "attribute list to be referred when job can be issued with restriction" is acquired by acquiring the value of the attribute ID 108 of the manager connected to MFP 201. At Step 54e05, the values of all attributes shown in the list at Step 54e04 are acquired. At Step 54e06 the contents of the job to be issued are compared with the value of each of all the attributes acquired at Step 54e05 to thereby judge whether the job can be issued. If the job can be issued, the job issue process continues. If it is judged at Step 54e06 that the job cannot be issued, then at Step 54e08 the "reason why the job service is not currently available" is displayed to thereafter terminate the job issue process. The display example of the status is not limited to the above embodiment, but other display examples may be used by classifying the statuses into various stages.

(Job Process with User Management Function)

[0270] Fig. 91 is a flow chart illustrating a user information check process to be executed before a job issue.

[0271] At Step 54b01 a user ID and a user password are entered. At Step 54b02 the peripheral devices are inquired about the service ID corresponding to the job manager to which the job is issued and the user ID and user password entered by the user at Step 54b01. This inquiry is performed by issuing a command using the operation code "CheckID" and the user ID and user password as parameters to the peripheral devices. MFP 201 processes the issued command in accordance with the flow chart shown in Fig. 51 to check whether the input user information was certified or not and return an answer. At Step 54b03 the answer data returned from MFP 201 is analyzed. At Step 54b04 it is checked whether the answer data returned from MFP 201 at Step 54b03 indicates that a job issue is permitted. If permitted, the job issue process continues.

[0272] If th job issue is not permitted at Step 54b04, then at Step 54b06 a message that a job is not permitted to issue is display d;. At Step 54b06 the user is again inquired wheth r th user ID and user password ar to b entered. If they are to b entered, th flow returns to Step 54b01, whereas if not, th job is not issued to thereafter terminat th process.

(Data Transmission Process Determining Process)

[0273] Fig. 92 is a flow chart illustrating a process of determining a data transmission process when a print job is issued by the print r driver 505, when a font data download job script is issued by the font management utility 508, when a form overlay data download job script is issu d by the font overlay utility 509, when a log download job script is issued by the log management utility 510, or when a color profile data download job script is issued by the color profile management utility 511. First, at Step 54c01 the location of the data to be transmitted is set in advance. This setting is performed by designating an address by a user or by generating an address by an application. Next, at Step 54c02 the attribute value 601 (supported data download process) in the attribute table of the subject manager stored in the device information database 502 is checked to judge whether the job containing the reference pointer (URL: Unified Resource Location) can be issued. If possible, at Step 54c06 a job script with the data reference pointer being contained in the job is generated. In this case, the job script can be generated irrespective of whether the transmission data is in the client or in the external. If the job with the reference pointer contained therein cannot be issued at Step 54c02, then at Step 54c03 it is checked whether the transmission data is in the client or in the external. If in the external of the client, at Step 54c04 the transmission data in the external of the client is once read to thereafter advance to Step 54c05. If the transmission data is in the client, the transmission data in the client itself is used to advance to Step 54c06. At Step 54c06 a job script with the transmission data contained therein is generated.

(Account Check Process)

[0274] At Step 72d01 shown in Fig. 93, the account utility acquires and analyzes account related data. At Step 72d02 the count data is compared with the limit data. If they are the same, it is judged that the account data already reaches the limit, and at Step 72d04 an error message (Fig. 95) is issued and at Step 72d05 a job issue rejection process is executed to thereafter terminate the process. If the count data is not the same as the count limit data, it is judged that the count data does not still reach the limit, and at Step 72d03 the account data is compared with the account limit data. If they are the same, it is judged that the account data already reaches the limit, and at Step 72d04 an error message (Fig. 96) is issued and at Step 72d05 the job rejection process is executed to thereafter terminate the process. If the account data is not the same as the account limit data, it is judged that the account data does not still reach the limit, and at Step 72d06 an increment corresponding to the job to be currently issued is added to the count data, and the result is set to Nl. At Step 72d07 it is checked whether the value Nl is near the count limit data. The criterion of this check differs depending upon the limit object, and the criterion value may be freely set by the user or administrator or may be fixed to a certain value, and is not specifically limited. If N1 is near the count limit value data, at Step 72d08 a warning message (Fig. 97) is issued to urge the user to determine whether the job is to be issued. If the user answers to stop the job issue at Step 72d09, then at Step 72d05 the job issue rejection process is executed to thereafter terminate the process. If the user answers to issue the job at Step 72d09 or if N1 is not near the count limit data at Step 72d07, then at Step 72d10 it is checked whether N1 reaches the count limit data. If it reaches, at Step 72d11 a warning message (Fig. 98) is issued to urge the user to determine whether the job is to be issued. If the user answers to stop the job issue at Step 72d12, then at Step 72d05 the job issue rejection process is executed to thereafter terminate the process. If the user answers to issue the job or if N1 does not reach the count limit data at Step 72d10, then at Step 72d13 an increment corresponding to the job to be currently issued is added to the account data, and the result is set to N2. At Step 72d14 it is checked whether the value N2 is near the account limit data. The criterion value of this check may be freely set by the user or administrator or may be fixed to a certain value, and is not specifically limited. If N2 is near the account limit value data, at Step 72d15 a warning message (Fig. 99) is issued to urge the user to determine whether the job is to be issued. If the user answers to stop the job issue at Step 72d16, then at Step 72d05 the job issue rejection process is executed to thereafter terminate the process. If the user answers to issue the job or if N2 is not near the account limit data at Step 72d14, then at Step 72d17 it is checked whether N2 reaches the account limit data. If it reaches, at Step 72d18 a warning message (Fig. 100) is issued to urge the user to determine whether the job is to be issued. If the user answers to stop the job issue at Step 72d19, then at Step 72d05 the job issue rejection process is executed to thereafter terminate the process. If the user answers to issue the job or if N2 does not reach the account limit data at Step 72d17, then the next process is executed.

(Issue of Scan Job and Data Upload Job)

[0275] Fig. 101 is a flow chart illustrating a process of: issuing a scan job by the scanner driver 506; issuing a font data upload job script by the font management utility 508; issuing a form overlay data upload job script by the font overlay utility 509; issuing a log data upload job script by the log management utility 510; and issuing a color profile data upload job script by the color profil management utility 511. Th process by ach softwar (control program) is common for all control programs, and the document data obtain d by scanning and the data (font data, form data, color

profile data and log data) to be uploaded ar described simply as "data" in the description for Figs. 101 and following figures. When a job is issued, a pointer to the data is designated together with a plurality of attribute values to b s t in the job script. First, at Step 5501 device information is checked. The details of this process have been described with reference to Fig. 89. N xt, at Step 5502 the device status is checked. The details of this process hav been described with reference to Fig. 90. After the check processes at Steps 5501 and 5502, a job process with a user management function is executed at Step 5503. The details of this process have been described with reference to Fig. 91. If the job process with the user management function is not executed, this Step may be omitted. At Step 5504, a process of determining a requesting data format (pointer to data) is executed. The details of this process will be later described with reference to Fig. 102. Next, at Step 5505, a process of determining a data reception process is executed. The details of this process will be later described with reference to Fig. 103. Next, at Step 5506 an account check process is executed. The details of this process have been described with reference to Figs. 93 and 94. Next, issued at Step 5507 are the job scripts generated by the above Steps and other job scripts necessary for the print job. Each manager of MFP 201 received the job script executes the process shown in Fig. 56, 61, 64, 65, 70, 71 or 68 (for scan job manager) and the process shown in Fig. 56, 61 or 75 (for font manager, form overlay manager, log manager, and color profile manager) to thereby execute the designated job. Lastly, at Step 6508 a data reception process is executed. The details of this process will be later described with reference to Fig. 104.

(Data Format Determining Process)

[0276] Fig. 102 is a flow chart illustrating a process of determining a data format when a scan job or a data upload job is issued. In this embodiment, this flow chart will be described by paying attention to a scan job. Therefore, if it is judged at Step 55a01 that the job is not the scan job, the flow advances to Step 55a06 whereat the data format suitable for the data upload job is determined to thereafter terminate the process, the details of which are omitted. If it is judged at Step 55a01 that the job is the scan job, then at Step 55a02 an original type or a prescan combination is set. The original type may be a color original, a monochrome original, an ozalid original, a text original, an image original, an original with a mixture of text and image, or the like. The original type discriminable by each device can be obtained by accessing the device information database 502. This process is realized by displaying the original types discriminable by each device on the user interface and designating a combination thereof. Namely, a combination of "color original" and "image original", a combination of "monochrome original" and "original mixed with text and image" or the like may be used. Next, at Step 55a03 the type (resolution, image type and the like) for obtaining scan data is designated for each set original type or prescan combination. Similar to the original type, the resolution and image type settable to each device can be obtained by accessing the device information database 502. This process is also realized by displaying the data types settable by each device on the user interface and designating a desired one. For one original type or prescan combination, one data format is designated. Next, at Step 55a04 a job script is generated for generating a desired data format for designated original type and prescan combination. An example of the scan job script will be later described with reference to Fig. 123. At Step 55a05 it is judged whether another data type is set. If another data type is to be designated, the flow returns to Step 55a02, whereas if not, the data format determining process is terminated.

(Data Reception Process Determining Process)

[0277] Fig. 103 is a flow chart illustrating a process of determining a data reception process when a scan job or a data upload job is issued. First, at Step 55b01 a data reception destination is set. The data reception destination is either the client PC issued the job or a device other than this client PC. If a device other than the client PC is to be set, detailed information such as the address of the reception destination and the like are also set. Next, at Step 55b02 it is checked whether the process to be executed is the scan job or the data upload job. In the case of the data upload job, data transmission only can be executed so that the flow advances to Step 55b05. In the case of the scan job, at Step 55b03 the transmission method for the device is determined. The transmission method supported by the device can be obtained by accessing the attribute value 602 (supported data upload process) of the attribute table of the scan job manager stored in the device information database 502. Therefore, the processes capable of being designated are displayed on the user interface and a desired one is designated. At Step 55b04 the designated transmission process is checked. If the data transmission is selected, the flow advances to Step 55b05, whereas reference transmission is set, the flow advances to Step 55b08. At Step 55b05 a job script for designating the data transmission is generated, and at Step 55b06 a job script for designating the reference transmission is generated. After the job script is generated at one of Steps 55b05 and 55b06, the data r ception process determining process is terminated.

(Data Reception Process)

[0278] Fig. 104 is a flow chart illustrating a process of determining a data r ception process when a scan job or a

data upload job is issued. First, at Step 55c01 a data reception destination is s t. Th data reception destination is that set at Step 55b01 (data rec ption process determining process, Fig. 103). If the data reception destination is the client PC its lf, th flow advances to Step 55c02 wh reat transmitted data or r ference data is received. If the data reception destination is a device other than the above-described client, the device is instructed to receiv data or referenc data.

(Copy Job Issue)

[0279] Fig. 105 is a flow chart illustrating a copy job issue process. To instruct a copy job issue, a plurality of attribute values to be set to the job script are designated. First, at Step 5601 a device information check process is executed. The details of this process have been described with reference to Fig. 102. Next, at Step 5602 the device status is checked. The details of this process have been described with reference to Fig. 90. After the check processes at Steps 5601 and 5602, a job process with a user management function is executed at Step 5603. The details of this process have been described with reference to Fig. 91. If the job process with the user management function is not executed, this Step may be omitted. Next, at Step 5604, an account check process is executed. The details of this process will be later described with reference to Fig. 93. Next, issued at Step 5605 are the job scripts generated by the above Steps and other job scripts necessary for the print job. Each copy manager of MFP 201 received the job script executes the process shown in Fig. 56, 61, 73, 65, 70, 71 or 68 to thereby execute the designated job.

(2-layer Job Script Structure)

[0280] Fig. 121 shows a 2-layer job script structure. In Fig. 121, each box such as JobStart and SetJob is a command packet (refer to Fig. 46) and a job script is constituted of a series of command packets. The command packets from JobStart to JobEnd constitute one job unit. The job unit is constituted of command packets SetJob for setting job attributes and a command packet group constituted of document units. The command packets from DocumentStart to DocumentEnd are discriminated as one document unit. The document unit is constituted of command packets SetDocument for setting document attributes and a command packet Send for designating data transmission or a command packet SendRequest for requesting data transmission.

(3-layer Job Script Structure)

[0281] Fig. 122 shows a 3-layer job script structure. In Fig. 122, each box such as JobStart and SetJob is a command packet (refer to Fig. 46) and a job script is constituted of a series of command packets. The command packets from JobStart to JobEnd constitute one job unit. The job unit is constituted of command packets SetJob for setting job attributes and a command packet group constituted of binder units. The command packets from BinderStart to BinderEnd are discriminated as one binder unit. The binder unit is constituted of command packets SetBinder for setting binder attributes and a command packet group constituted of document units. The command packets from DocumentStart to DocumentEnd are discriminated as one document unit. The document unit is constituted of command packets SetDocument for setting document attributes and a command packet Send for designating data transmission or a command packet SendRequest for requesting data transmission.

(Example of Scan Job Script)

[0282] Fig. 123 shows an example of the structure of a scan job script made of two layers. As described with Fig. 122, the scan job script may be made of three layers. In the scan job script, each document unit is used for instructing which type of data is generated when a particular original type is detected. The document attribute "original type" shown in Fig. 123 indicates the original type for which the document unit is referred to. The document attributes "resolution" and "image type" indicate the data type generated by the document unit. In a document unit 1 shown in Fig. 123, "PreScan & Color" is designated for the "original type". This means that when the prescan is designated and the original type is a color original, the document unit 1 is referred to. Similarly, a document unit 2 is referred to when the original type is a color original, and a document unit 3 is referred to when the original type is a monochrome original. If the prescan is off and the color original is to be scanned, the document units 2 and 3 are referred to to thereby generate at the same time the data of 1200 dpi of JPEG and the data of 1200 dpi of bit map. If the prescan is on and the monochrome original is to be scanned, data is not generated because the corresponding original type is missed.

[0283] The command packet SendRequest shown in Fig. 123 indicates how data is transmitted to which destination by which transmission process. For xampl , if th transmission process is "data transmission", the data after scanning is directly transmitted. If th transmission process is "reference transmission", th data after scanning is stored in the devic and only th refer nce data is transmitted. "cli nt PC itself" and "devic oth r than th client PC" indicate the data transmission destination and use network address information or the like.

(Job Management Command Issue)

[0284] Fig. 106 is a flow chart illustrating a process to be executed wh n the job management utility 512 issu s a job management command. At Step 5701 the job table (Fig. 20) possessed by the manager is acquired from MFP 201 by using the service ID of the manager as a parameter. At Step 5702 the job ID of the job to be managed is selected by a proper method from the job list in the acquired job table. As this selection method, for example, the job list is displayed on the display 6003 via the user interface 501 to make a user select the job ID. At Step 5703 a job management command having he designated job ID as a parameter is generated and issued to thereafter terminate the process. MFP 201 received the job management command executes the process shown in Figs. 47, 48, 49, 50, 51 or 76 to manage the designated job.

[0285] The invention may be applied to a system constituted of discrete copy machines, printers, scanners and the like or to a discrete apparatus such as a copy machine and a facsimile apparatus. The objects of the invention can be achieved by supplying the system such as shown in Fig. 2 with a recording medium (Figs. 107 and 108) storing program codes of software (control programs) realizing the functions of the embodiment, and by making the apparatus (CPU 301, CPU 6001) of the system read and execute the program codes stored in the storage medium. As a method of supplying programs and data shown in Fig. 77 to the client PC, the programs and data are generally stored in a floppy disk FD 7000 shown in Fig. 109 and supplied to a PC 7001. In this case, the programs themselves read from the storage medium realize the functions of the embodiment and the storage medium storing the program codes constitute the present invention.

[0286] The storage medium for storing program codes may be, in addition to a floppy disk and a hard disk, an optical disk, a magneto-optical disk, a CD-ROM, a CD-R, a magnetic tape, a nonvolatile memory card, a ROM and the like. It is obvious that the scope of the invention contains not only the case wherein the functions of the embodiment are realized by executing the program codes read by a computer but also the case wherein the functions of the embodiment are realized by making an OS (operating system) or the like running on a computer execute a portion or the whole of actual processes in accordance with the stored program codes. It is obvious that the scope of the invention also contains the case wherein the functions of the embodiment are be realized by writing the program codes read from the storage medium into a memory of a function expansion board inserted into a computer or of a function expansion unit connected to the computer, and thereafter by executing a portion or the whole of actual processes by a CPU of the function expansion board or function expansion unit.

[0287] Fig. 110 is a cross sectional view showing the internal structure of a laser beam printer (hereinafter abbreviated as LBP) applicable to the laser beam printer engines 103 and 104 shown in Fig. 1. This LBP can print out input character pattern data or the like on a recording sheet. Referring to Fig. 110, reference numeral 8012 represents LBP which forms a image on a recording sheet in accordance with supplied character pattern data or the like. Reference numeral 8000 represents an operation panel provided with a switch, an LED display and the like. Reference numeral 8001 represents a printer control unit for controlling the whole of LBP 8012 and analyzing character pattern data and the like. The printer control unit 8001 operates mainly to convert character pattern data into video signals and output them to a laser driver 8002. The laser driver 8002 drives a semiconductor laser 8003 to turn on and off a laser beam 8004 to be emitted from the semiconductor layer 8003, in accordance with an input video signal. The laser beam is swung right and left by a rotary polygon mirror 8005 to scan an electrostatic drum 8006. Therefore, an electrostatic latent image of character patterns is formed on the electrostatic drum 8004. This latent image is developed by a developing unit 8007 disposed around the electrostatic drum 8006 and then transferred to a recording sheet. As the recording sheet, cut sheets are used which are accommodated in a plurality of paper cassettes 8008 corresponding to a plurality type of sheets and mounted on LBP 8012, and transported to the electrostatic drum 8006 by paper feed rollers 8009 and transport rollers 8010 and 8011.

[0288] Fig. 111 is a perspective view of an ink jet recording apparatus IJRA applicable to the ink jet printer engine 105 shown in Fig. 1. Referring to Fig. 111, as a drive motor 9011 rotates in the normal or reverse direction, drive force transmission gears 9010 and 9008 make a lead screw 9004 rotate. The lead screw 9004 is formed with a spiral groove 9004 with which a carriage HC having pins (not shown) is engaged.

Therefore, the carriage HC reciprocally moves in the directions indicated by arrows a and b. An ink jet cartridge IJC is mounted on this carriage HC.

Reference numeral 9001 represents a paper pusher which pushes a paper sheet against a platen 9000 over the motion span of the carriage. Reference numerals 9006 and 9007 represent photocouplers which constitute a home position detecting means for detecting a lever 9005 of the carriage in the region of the motion span and switching the rotation direction of a motor 9011. Reference numeral 9013 represents a member for supporting a cap member 9010 which covers the front surface of a recording head. Reference numeral 9012 represents a suction means for sucking air in the inside of the cap to thereby perform a suction/recovery process for the recording head, via an opening 9020 in the cap. Reference numeral 9014 repr s nts a cleaning blade, and reference numeral 9016 repres nts a memb r for moving the blad back and forth, the cleaning blade 9014 and member 9016 being supported by a support plate 9015. Obviously, a

know cleaning blade may b used in stead of the blade 9014 of this type. Reference num ral 9018 represents a lever for starting the suction process of th suction/recovery process. This lever 9018 moves as a cam 9017 engaged with the carriage and controls a driv force supplied from the drive motor by a known transmission means such as a clutch. Thes capping, cleaning and suction/recovery process s are configured so that the d sired op rations of th s process s are performed at corresponding positions when th carriage enters the hom position side region by the operation of th lead screw 9004. Other configurations may also be adopted so long as the desired operations of the processes can be performed at proper timings.

[0289] As described so far, according to the embodiment, the functions of each logical device to which a job is issued from an information processing apparatus are stored, the logical device control programs (scan job manager 419, print job managers 501 to 509, copy job managers 601 to 608) for managing a job issued to the logical device and the functions of each peripheral device engine are stored. Therefore, a job can be analyzed by using the physical device control programs (scanner controller 420, LBP controllers 510 and 511, ink jet controller 512) for managing the job to be executed at the device engine.

[0290] The physical device control program includes a scanner control program (scanner controller 420) for controlling a peripheral scanner engine. The physical control program includes a laser beam printer control program (LBP controllers 510 and 511) for controlling a peripheral laser beam printer engine. The physical device control program includes an ink jet printer control program (ink jet printer controller 512) for controlling a peripheral ink jet printer engine. The logical device control program includes a print job control program (print job managers 501 to 509) for controlling a laser beam printer control program, an ink jet printer control program, or the laser beam printer control program and jet printer control program. The logical device control program includes a scanner job control program (scanner job manager 419) for controlling a scanner control program. The logical device control program includes a copy job control program (copy job managers 601 to 608) for controlling a scanner control program and laser beam printer control program, an ink jet printer control program, or a laser beam printer control program and ink jet printer control program.

[0291] With the structure described above, the logical device control program can posses the relation to at least one device engine which the logical device used for executing a job. In accordance with a job issued to the logical device, the device engine used for actual execution of the job can be determined. The functions possessed by the logical device control program can be changed. A job issued to the logical device can be managed in correspondence with a job managed by the physical device which executes an actual job. An optimum logical device control program can be selected from a plurality of logical device control programs through comparison of load status of these programs. A supervising program (super visor 410) for collectively controlling the logical device control programs can possess the sub address and connection interface type to be used when a job is issued to each logical device control program, in correspondence with each logical device control program. The supervising program also possesses a list of information on whether each sub address is effective or invalid and can cancel the job issued to the invalid sub address. The supervising program also possesses a list of certification information of permitted users and can issue an error notice of a job if the user information contained in the job is not contained in the list of certification information. The supervising program can possess a list of security levels representative of the type of a certification judgement process for permitted users. The logical device control program can possess a list of connection interfaces and transmission destination addresses for transmitting even data to an information processing apparatus when an event occurs while a job is analyzed. When an event occurs while a job is analyzed by the logical device control program, event data can be transmitted by referring to the list of connection interfaces and transmission destination addresses for transmitting even data to an information processing apparatus.

[0292] As described so far, according to the embodiment, in accordance with a function (attribute value) acquired from a peripheral device, a user interface for a control program for controlling the peripheral device can be automatically configured (Step 4813). In accordance with an acquired function, a display (Figs. 81 and 82) of the user interface of a peripheral device can be controlled. Information (attribute value) on the setting range of the function of a peripheral device can be acquired. The information on the setting range is represented by a combination of job setting prohibited attributes (attribute IDs 801 to 805). Information (attribute value) regarding a function selection item of a peripheral device can be acquired. The attribute value can be acquired by acquiring an attribute list indicating the function of a peripheral device from this device and by designating the attribute ID of the attribute list. The attribute list indicating the functions of a physical device control program and logical device control program of a peripheral device, a resource control program and a supervising program for controlling these programs can be acquired from the peripheral device. The physical device control program includes a scanner control program for controlling a peripheral scanner engine. The physical device control program includes a laser beam printer control program for controlling a peripheral laser b am printer engin .

[0293] The physical device control program includes an ink jet printer control program for controlling a peripheral ink jet printer engin . Th logical device control program includes a print job control program for controlling a laser printer control program, an ink j t printer control program, or the laser print r control program and ink jet printer

control program. The logical devic control program includ s a scanner job control program for controlling a peripheral scanner control program. The logical devic control program includes a copy job program for controlling a scanner control program and laser beam printer control program, an ink jet printer control program, or the laser b am printer control program and ink jet printer control program. The resource control program includes a font control program for managing fonts of each peripheral device. The resource control program includes a log control program for managing logs of each peripheral device. The resource control program includes a color profile control program for managing color profiles of each peripheral device.

[0294] As described so far, according to the embodiment, in accordance with the function acquired from a peripheral device (MFP 201), whether a job script can be issued to the peripheral device is judged (Steps 5402 to 5404, Steps 5502 to 5504, Steps 5602 to 5604). A job issue process can therefore be controlled in accordance with the judgement result.

[0295] The attribute list indicating the functions of a physical device control program and logical device control program of a peripheral device, a resource control program (font manager 413, form overlay manager 414, log manager 415, color profile manager 416) and a supervising program for controlling these programs can be acquired from the peripheral device. A combination of job setting prohibited attributes (attribute IDs 801 to 805) can be acquired. A download job or print job is issued to a peripheral device. An upload job or scan job is issued to a peripheral device. A job issue process is selected in accordance with the attribute (attribute ID 601) indicating a support of a download process for an acquired function and a location of data for which a job is issued. A job issue process is selected in accordance with the attribute (attribute ID 602) indicating a support of an upload process for an acquired function and a location of data for which a job is issued. The data for which a job is issued includes print document data. The data for which a job is issued includes scan document data. The data for which a job is issued includes font data. The data for which a job is issued includes form overlay data. The data for which a job is issued includes color profile data. The data for which a job is issued includes log data. The data for which a job is issued includes font data. Event format data corresponding to an event is acquired from a peripheral device, and the received event is analyzed in accordance with the event format data. Log data and log format data thereof of a peripheral device are acquired, and the log data is analyzed in accordance with the log format data. Account data (count data) and format data thereof of a peripheral device are acquired, and the account data is analyzed in accordance with the account format data.

[0296] As described so far, according to the invention, the peripheral apparatus connected to the information processing apparatus comprises: input means for inputting a job script constituted of packet data from the information processing apparatus; means for, after the peripheral apparatus analyzes the job script acquired by the input means, generating a proper job file in accordance with the script contents, the job script containing one or a plurality of binders and documents and the binder constituting the document and providing a hierarchical structure in a job; means for making the peripheral apparatus analyze the job script of the hierarchical structure; means for, after the job script of the hierarchical structure is analyzed, generating a job file and at the same time, generating another binder file and another document file or generating a document file in a binder file; and means for properly processing the generated job file, binder file and document file. Accordingly, it is possible to execute the following processes. Namely, various controls can be executed as different units including a job scheduling unit (job execution priority degree, job execution cancel and the like), a combined document unit (binder) and each document unit. In the job process, information of the process result on the binder unit basis and a document unit basis can be acquired. In the job process, setting can be newly performed or changed by each binder unit on the binder unit basis and a document unit basis. In each print job, the job can be processed on a media basis such as an output paper sheet and a finishing unit basis such as a staple. In each scan job, the job can be processed on an original read control unit base and a scan image control unit basis.

[0297] In a job issue system with a user management function of this embodiment, a peripheral apparatus, wherein user information is added to a job and the job execution is controlled in accordance with the user information, is provided with means for performing a user information certification prior to issuing the job. It is therefore possible to certify the user information before the job issue.

[0298] Means is provided for using a user ID as the user information to be used for the certification. It is therefore possible to certify the user information from the user ID prior to the job issue.

[0299] Means is provided for using a user ID and a user password as the user information to be used for the certification. It is therefore possible to certify the user information from the user ID and user password prior to the job issue.

[0300] Means is provided for using a user ID and a service type as the user information to be used for the certification. It is therefore possible to certify the user information from the user ID and service type prior to the job issue.

[0301] Means is provided for using a user ID, a user password and a service type as the user information to be used for the certification. It is therefore possible to certify the user information from the user ID, user password and service typ prior to the job issue.

[0302] Means is provided for confirming user information prior to transmitting a job to a peripheral apparatus and means is provided for adding user information to a job to be transmitted to the peripheral apparatus. It is therefore possibl to judge from the user information whether a job can be issued.

[0303] Means is provided for using a user ID as the user information. It is ther fore possible to judge from the us r ID as the user information wheth r a job can be issued.

[0304] M ans is provided for using a us r ID and a user password as th us r information. It is therefore possibl to judg from the user ID and user password as th user information wh ther a job can be issued.

[0305] Means is provided for using a user ID and a service typ password as the user information. It is therefore possible to judge from the user ID and service type as the user information whether a job can be issued.

[0306] Means is provided for using a user ID, a user password and a service type password as the user information. It is therefore possible to judge from the user ID, user password and service type as the user information whether a job can be issued.

[0307] According to an embodiment, a peripheral apparatus which stores the current status thereof and can control the job execution in accordance with the current status, is provided with means for returning the current status of the peripheral apparatus in response to a request for the current status from the client PC. Accordingly, it is possible for the client PC to acquire the current status of the peripheral apparatus and know whether the job can be executed, prior to issuing the job.

[0308] Means is provided for expressing the current status of the peripheral apparatus by three states, a normal state, a normal state with restriction and an abnormal state. Accordingly, it is possible for the client PC to know the current status of the peripheral apparatus by the three states, normal state, normal state with restriction and abnormal state and to know whether the job can be executed, prior to issuing the job.

[0309] Means is provided for returning an attribute value of "list to be referred to when a job can be executed with restriction" stored in the peripheral apparatus if the current status of the peripheral apparatus is the normal state with restriction and when a reason therefor is inquired by the client PC. Accordingly, the restriction can be notified if the current status of the peripheral client PC is the normal state with restriction, prior to issuing the job.

[0310] Means is provided for returning a value of "reason of abnormal state" stored in the peripheral apparatus if the current status of the peripheral apparatus is the abnormal state and when a reason therefor is inquired by the client PC. Accordingly, the reason for the inability of the job issue by the client PC can be notified of the current status, prior to issuing the job.

[0311] Means is provided for requesting for the current status of the peripheral apparatus before a job is transmitted to the peripheral apparatus. Accordingly it is possible to acquire the current status of the peripheral apparatus and to know whether the job can be executed, prior to issuing the job.

[0312] Means is provided for issuing a job when the current status of the peripheral apparatus is the normal state. It is therefore possible to transmit the job after it is confirmed whether the job can be executed, prior to issuing the job.

[0313] Means is provided for acquiring an attribute value of "list to be referred to when a job can be executed with restriction" stored in the peripheral apparatus if the current status of the peripheral apparatus is the normal state with restriction, means is provided for comparing the attribute value with contents of the job; and means is provided for issuing the job if the job contents satisfy the attribute value. It is therefore possible to transmit a job after it is confirmed that the job can be executed with restriction and the restriction is eliminated, prior to issuing the job.

[0314] Means is provided for acquiring an attribute value of "list to be referred to when a job can be executed with restriction" stored in the peripheral apparatus if the current status of the peripheral apparatus is the normal state with restriction, means is provided for comparing the attribute value with contents of the job, means is provided for inhibiting an issue of the job if the job contents do not satisfy the attribute value, and means is provided for displaying the reason of inhibition. It is therefore possible to inhibit a transmission of the job although the job execution is possible with restriction, if this restriction cannot be eliminated, prior to issuing the job.

[0315] Means is provided for acquiring an attribute value of "reason for an abnormal state" stored in the peripheral apparatus if the current status of the peripheral apparatus is the abnormal state, and means is provided for displaying the "reason for an abnormal state". It is therefore possible to inhibit a transmission of the job after it is confirmed that the job execution is impossible, prior to issuing the job.

[0316] According to an embodiment, a peripheral apparatus with a job account function in an account check system is provided with means for storing an account limit value for account information and means for transmitting the account information to a client PC in response to a request from the client PC. It is therefore possible to acquired the account information before the client PC issues a job.

[0317] Means is provided for requesting the peripheral apparatus to supply the account information regarding the contents of a jot to be transmitted before the job is transmitted to the peripheral apparatus, means is provided for analyzing the account information answered from the peripheral apparatus, means is provided for judging from the analyzed account information whether the job contents are already in excess of the account limit value, means is provided for displaying an error m ssage if in exc ss of the account limit value, and means is provided for executing a job issue rejecting process if in excess of the account limit value. It is therefore possible to judge whether th job to be issued is already in excess of the account limit valu , prior to issuing the job to the p ripheral apparatus. A transmitted job do s not discarded therefore without being execut d at th peripheral apparatus b caus of th account

limit value.

[0318] Means is provided for storing a reference value to b used for judging whether th account information is near the account limit valu , means is provided for judging from the analyzed account information whether th job contents are near the account limit value, means is provided for displaying a warning message if the job contents ar near the account limit value; means is provided for inquiring whether the job is issued ev n if the job contents are near the account limit value; means is provided for acquiring a user judgement whether the job is issued; and means is provided for performing a job issue rejection process if the user determines to inhibit the job issue. It is therefore possible for a user to determine whether the job is issued, if the job contents to be issued are near the account limit value, prior to issuing the job to the peripheral apparatus. It is therefore possible to reflect user intention on the job execution condition.

[0319] According to an embodiment, a peripheral apparatus capable of registering, storing and deleting a plurality of account IDs and corresponding account counters, comprises: means for analyzing a user ID and an account ID added to a transmitted job; means for determining which of the user ID and the account ID is charged; and means for charging the account counter corresponding to the determined user ID or the determined account ID. Therefore, an account can be managed automatically only by processing the information added to a transmitted job, without any operation at the peripheral apparatus.

[0320] Means for registering, storing and deleting an attribute representative of a one-to-multiple relation of user IDs belonging to each account ID, means for analyzing the user ID added to a transmitted job and means for charging the counter for the job in accordance with to which account ID the user ID added to the job belongs, are provided. Therefore, it is possible to charge the account ID belonging to the user ID for the job.

[0321] Means for registering, storing and deleting a plurality of account IDs and corresponding counters, means for registering, storing and deleting an attribute representative of a relation of user IDs belonging to each account ID in a one-to-multiple relation, means for analyzing information on which one of the user ID and account ID added to a transmitted job is charged, and means for charging the counter for the job in accordance with to which account ID the user ID added to the job belongs, are provided. It is therefore possible to determine whether which one of the user ID or account ID belonging to the user ID is charged.

[0322] Means for analyzing the user ID and account ID added to a transmitted job, and means for charging the counter for the job in accordance with the account ID added to the job, are provided. It is therefore possible to change the account ID selected by the user.

[0323] Means for analyzing the account ID added to a transmitted job, means for analyzing the information on which one of the user ID and account ID added to the transmitted job is charged, and means for charging the counter for the job in accordance with the account ID added to the job, are provide. It is therefore possible to determine whether which one of the user ID or the account ID selected by the user is charged.

[0324] Means for analyzing the account ID added to a transmitted job, means for analyzing the information on which one of the user ID and account ID added to the transmitted job is charged, and means for charging the counter for the job in accordance with the account ID added to the job, are provided. It is therefore possible to determine whether which one of the user ID, the account ID belonging to the user ID, or the account ID selected by the user is charged.

[0325] Means is provided for performing a user certification process for the user ID counter or account ID counter by using a user ID and password added to the job. It is therefore possible to perform a user certification in accordance with the user ID.

[0326] Since there is provided means for adding a user ID to a job to be transmitted to a peripheral apparatus, an account management using the user ID is possible.

[0327] Since there is provided means for adding a user ID and account ID to a job to be transmitted to a peripheral apparatus, an account management using the user ID and account ID is possible.

means for adding information representative of whether which one of the user ID and account ID is charged, to a job to be transmitted to a peripheral apparatus. It is therefore possible to switch between account objects.

[0328] According to the embodiment, a plurality type of document data of the type desired by a user in accordance with the type of an original to be scanned, can be generated at a time in one scan job.

[0329] The peripheral control software acquires a document data type and original type which can be generated by the scanner. It is possible to select the scanner which can generate a job for obtaining document data of a desired type and can generate desired data.

[0330] According to this embodiment, a plurality type of document data having the type desired by a user can be generated by one scan operation by designating a prescan. The peripheral device control software acquires a document data type which the scanner can generate. It is possible to select the scanner which can generate a job for obtaining document data of a desired type and can generate desired data.

[0331] According to this embodiment, a plurality type of document data d sired by a user can be generated at a time by as small number of scan operations as possible.

[0332] As appreciated from the for going description, according to th embodiment, prior t the job r quest from a

client PC, it is judged whether th account for th job xecution exceeds th account limit valu . If exce ds, the job issue is inhibited to prev nt congest d traffics in advance.

[0333] According to the mbodiment, if the account is in xcess of th account limit valu or is likely to exceed it, this effect is notified so that the system us in a n twork environm nt can b improved considerably.

[0334] According to the embodiment, the account object can be selected from the account identification code and/or service identification code corresponding to each user identification code. It is therefore possible to realize an account system adaptive to use objects and applications.

[0335] According to the embodiment, prior to transmitting a job from the external, this job issue is inhibited or regulated if the job execution is impossible so that the network traffics can be relaxed. Also, prior to transmitting a job, a user certification process is executed so that an unnecessary job is not issued and an increase in traffics can be prevented in advance.

[0336] Further aspects of the present invention relate to control methods for carrying out the functions of embodiments of the peripheral apparatus and the system of the present invention. In addition, the present invention relates to computer programs for carrying out the methods of the present invention or for implementing embodiments of the peripheral apparatus and system of the present invention. The computer programs may be carried on a variety of carrier media such as a signal (from the Internet or from a local network) or a storage medium.

Claims

1. A peripheral apparatus for making each function means execute a job in response to a job request from a client, comprising:

   means for storing an account limit value of the client;

   means for judging whether an account value corresponding to the job request from the client reaches the account limit value; and

   means for regulating a transmission of the job by the client in accordance with a judgement result by said judging means.

2. A peripheral apparatus according to claim 1, wherein the function means includes a printer function.

3. A peripheral apparatus according to claim 2, wherein the printer function corresponds to a physical printer and a logical printer.

4. A peripheral apparatus according to claim 1, wherein the function means includes a scanner function.

5. A peripheral apparatus according to claim 1, wherein a plurality type of function means are provided and a variety of functions are realized by combining various function means in response to the job request.

6. A peripheral apparatus according to claim 5, wherein the function includes a copy function.

7. A peripheral apparatus for making each function means execute a job in response to a job request from a client, comprising:

   means for storing an account limit value of the client;

   means for judging whether an account value corresponding to the job request from the client reaches the account limit value; and

   means for regulating a transmission of the job by the client in accordance with a judgement result by said judging means, and returning an error message.

8. A peripheral apparatus for distributing a job to each function means in respons to a job request from a client, comprising:

means for storing an account limit value of th client;

means for comparing an account valu corresponding to th job request from the cli nt with th account limit value; and

means for notifying that the account value reaches near the account limit value, in accordance with a judgement result by said judging means.

9. A method of controlling a peripheral apparatus for distributing a job to each function means in response to a job request from a client, comprising the steps of:

storing an account limit value of the client;

judging whether an account value corresponding to the job request from the client reaches the account limit value; and

regulating a transmission of the job by the client in accordance with a judgement result at said judging step.

10. A computer readable storage medium storing a control program for a peripheral apparatus for making each function means execute a job in response to a job request from a client, the control program comprising the steps of:

storing an account limit value of the client;

judging whether an account value corresponding to the job request from the client reaches the account limit value; and

regulating a transmission of the job by the client in accordance with a judgement result at said judging step.

11. A peripheral system having an information processing apparatus and a peripheral apparatus connected by a network, wherein the peripheral apparatus comprises:

means for judging whether an account value corresponding to a job request issued from the information processing is in excess of an account limit value; and

means for regulating a transmission of the job by the information processing apparatus if the account value is in excess of the account limit value.

12. A peripheral system according to claim 11, wherein the peripheral apparatus and the information processing apparatus communicate each other with respect to contents of the job prior to issuing job from the information processing apparatus.

13. A peripheral system according to claim 12, wherein the function means includes a printer function.

14. A peripheral system according to claim 13, wherein the printer function corresponds to a physical printer and a logical printer.

15. A peripheral system according to claim 12, wherein the function means includes a scanner function.

16. A peripheral system according to claim 12, wherein a plurality type of function means are provided and a variety of functions are realized by combining various function means in response to the job request.

17. A peripheral system according to claim 16, wherein the function includ s a copy function.

18. A peripheral apparatus comprising:

setting m ans for setting an account identification code corresponding to each of a plurality of user identification codes;

d tecting m ans for analyzing a user identification code added to a transmitted job and detecting a corresponding account code; and

accounting means for charging a client corresponding to the account identification code for the job.

19. A peripheral apparatus according to claim 18, wherein said accounting means includes counters corresponding to the account identification code and the user identification code.

20. A peripheral apparatus capable of registering, storing and deleting a plurality of user identification codes and account identification codes and account counters corresponding to the user identification codes and the account identification codes, comprising:

means for registering, storing and deleting a relation of user IDs belonging to each account identification code;

means for analyzing the user ID added to a transmitted job; and

accounting means for executing a charging operation relative to a counter corresponding to the account ID to which the user ID added to the job belongs.

21. A peripheral apparatus according to claim 20, wherein said registering means registers a relation between the account identifier codes and the user identifier codes.

22. A peripheral apparatus capable of registering, storing and deleting a plurality of account IDs and corresponding account counters, comprising:

means for analyzing a user ID and an account ID added to a transmitted job;

means for determining which of the user ID and the account ID is charged; and

means for charging the account counter corresponding to the determined user ID or the determined account ID.

23. A peripheral apparatus according to claim 22, further comprising means for performing a user certification relative to the account counter for the user ID or the account counter for the account ID, by using the user ID and a password added to the job.

24. A peripheral apparatus connected via a network to an information apparatus,

wherein the peripheral apparatus comprises control means for controlling a plurality of function means and accounting means for charging for a use of the function means; and

said charging means charges for a user and/or a client identified by a user identification code and/or an account identification code supplied from the information processing apparatus.

25. A peripheral apparatus according to claim 24, wherein the network is of the Ethernet, IEEE 1394 or IEEE 1284.

26. A peripheral apparatus according to claim 24, wherein the information processing apparatus is a personal computer of a client.

27. A p ripheral apparatus according to claim 24, wherein th function means is a print r.

28. A peripheral apparatus according to claim 27, wherein th printer is a physical printer and a logical printer.

29. A peripheral apparatus according to claim 24, wherein th function m ans is a scanner.

30. A peripheral apparatus according to claim 24, wherein the function means includes a logical apparatus combining a plurality of function means.

31. A peripheral apparatus according to claim 29, further comprising means for regulating to combine the function means.

32. A peripheral system including an information processing apparatus and a peripheral apparatus having a plurality of functions and connected via a network to the information processing apparatus,
wherein the peripheral apparatus comprises:

means for discriminating between a user identification code and an account identification code; and

means for charging for a use of the function in accordance with the discriminated identification code.

33. A peripheral system according to claim 32, wherein the user identification code is an identifier for identifying a user.

34. A peripheral system according to claim 32, wherein the user identification code is an identifier for identifying a client.

35. A peripheral system according to claim 32, wherein the function means is a printer.

36. A peripheral system according to claim 35, wherein the printer includes a physical printer and a logical printer.

37. A method of controlling a peripheral apparatus capable of registering, storing and deleting a plurality of user identification codes and account identification codes and account counters corresponding to the user identification codes and the account identification codes, comprising the steps of:

analyzing the user ID added to a transmitted job; and

executing a charging operation relative to a counter corresponding to the account ID to which the user ID added to the job belongs.

38. A computer readable storage medium storing a control program for a peripheral apparatus capable of registering, storing and deleting a plurality of user identification codes and account identification codes and account counters corresponding to the user identification codes and the account identification codes, the control program comprising the steps of:

analyzing the user ID added to a transmitted job; and

executing a charging operation relative to a counter corresponding to the account ID to which the user ID added to the job belongs.

39. A storage medium according to claim 38, wherein the medium is a disk type storage medium.

40. An accounting apparatus comprising:

setting means for setting a relation between a user identification code, an account identification code and a service identification code; and

charging means for charging an account counter corresponding to on of the identification codes for a job.

41. A peripheral apparatus comprising:

means for storing a status of th p ripheral apparatus; and

output means for reading and outputting the status in response to an ext rnal request,

wherein said output means outputs the status at least as a normal state, an abnormal state or a normal state with restriction.

42. A peripheral apparatus according to claim 41, wherein the peripheral apparatus is a printer.

43. A peripheral apparatus according to claim 42, wherein the normal state with restriction corresponds to an output sheet number limit of the printer.

44. A peripheral apparatus according to claim 41, wherein the normal state with restriction corresponds to an output resolution limit of the printer.

45. A method of controlling a peripheral apparatus comprising the steps of:

storing a status of the peripheral apparatus; and reading and outputting the status in response to an external request,

wherein said reading and outputting step outputs the status at least as a normal state, an abnormal state or a normal state with restriction.

46. A computer readable storage medium storing a control program for a peripheral apparatus, the control program comprising the steps of:

storing a status of the peripheral apparatus; and

reading and outputting the status in response to an external request,

wherein said reading and outputting step outputs the status at least as a normal state, an abnormal state or a normal state with restriction.

47. A peripheral apparatus which stores a current status thereof and can control execution of a job in accordance with the current status, comprising:

means for storing the current status of the peripheral apparatus; and

means for returning the current status of the peripheral apparatus in response to a request from a client.

48. A peripheral apparatus according to claim 47, wherein the status stepwise represents the state of the peripheral apparatus.

49. A peripheral apparatus according to claim 48, wherein the stepwise status of the peripheral apparatus includes three states, a normal state, a normal state with restriction and an abnormal state.

50. A peripheral apparatus according .to claim 48, further comprising means for returning a value of "list to be referred to when a job can be executed with restriction" stored in the peripheral apparatus if the current status of the peripheral apparatus is the normal state with restriction and when a reason therefor is inquired by the client.

51. A peripheral apparatus according to claim 48, furth r comprising means for returning a value of "reason of abnormal stat " stor d in th p ripheral apparatus if the current status of the peripheral apparatus is the abnormal state and when a reason therefor is inquired by the cli nt.

52. A peripheral apparatus according to claim 48, furth r comprising m ans for issuing a job when the current status of th peripheral apparatus is th normal stat .

53. A peripheral apparatus according to claim 48, further comprising:

means for acquiring an attribute value of "list to be referred to when a job can be executed with restriction" stored in the peripheral apparatus if the current status of the peripheral apparatus is the normal state with restriction;

means for comparing the attribute value with contents of the job; and

means for issuing the job if the job contents satisfy the attribute value.

54. A peripheral apparatus according to claim 48, further comprising:

means for acquiring an attribute value of "list to be referred to when a job can be executed with restriction" stored in the peripheral apparatus if the current status of the peripheral apparatus is the normal state with restriction;

means for comparing the attribute value with contents of the job;

means for inhibiting an issue of the job if the job contents do not satisfy the attribute value; and

means for displaying a reason for inhibiting the issue.

55. A peripheral apparatus according to claim 48, further comprising means for acquiring an attribute value of "reason for an abnormal state" stored in the peripheral apparatus if the current status of the peripheral apparatus is the abnormal state; and
means for displaying the "reason for an abnormal state".

56. A peripheral apparatus for processing a job request supplied from an information processing apparatus connected to a network, comprising:

means for storing a status of the peripheral apparatus;

judging means for judging from the status whether a job requested from the information processing apparatus is executable; and

means for regulating a job issue from the information processing apparatus if a judgement result by said judging means indicates an inexecutable job.

57. A peripheral apparatus according to claim 56, wherein the status stepwise represents the state of the peripheral apparatus.

58. A peripheral apparatus according to claim 56, wherein the stepwise status of the peripheral apparatus includes three states, a normal state, a normal state with restriction and an abnormal state.

59. A method of controlling a peripheral apparatus for processing a job request supplied from an information processing apparatus connected to a network, comprising the steps of:

storing a status of the peripheral apparatus;

judging from th status whether a job requ st d from th information processing apparatus is xecutabl ; and

regulating a job issu from th information processing apparatus if a judgement result by said judging step indicates an in x cutable job.

60. A method of controlling a p ripheral apparatus according to claim 59, wherein th status stepwise represents the state of the peripheral apparatus.

61. A peripheral apparatus for processing a job request supplied from an information processing apparatus connected to a network, comprising:

means for storing user information supplied from the information processing apparatus; and

means for performing a user certification in accordance with the user information prior to issuing the job request.

62. A peripheral apparatus according to claim 61, wherein the user information is a user identification code.

63. A peripheral apparatus according to claim 61, wherein the user information is a user identification code and a user password.

64. A peripheral apparatus according to claim 61, wherein the user information is a user identification code and/or a service identification code representative of a user password and/or a type of service.

65. A method of controlling a peripheral apparatus for processing a job request supplied from an information processing apparatus connected to a network, comprising the steps of:

storing user information supplied from the information processing apparatus; and

means for performing a user certification in accordance with the user information prior to issuing the job request.

66. A system having an information processing apparatus and a peripheral apparatus connected via a network, wherein:

the information processing apparatus transmits user information via the network prior to issuing the a job request; and

the peripheral apparatus performs a user certification in accordance with the user information, and regulates an issue of the job request by the information processing apparatus, in accordance with a result of the user certification.

67. A system according to claim 66, wherein the peripheral apparatus is a printer.

68. A system according to claim 67, wherein the printer is a physical printer and a logical printer.

69. A system according to claim 66, wherein the peripheral apparatus is a scanner.

70. A system according to claim 66, wherein the peripheral apparatus is a printer and a scanner and can execute a copy job.

71. A system according to claim 66, wherein the user information is a user identification code.

72. A system according to claim 66, wherein the user information is a user identification code and a user password.

73. A peripheral apparatus according to claim 66, wh rein th user information is a user identification code and/or a service identification cod representativ of a user password and/or a type of service.

74. A method of carrying out the functions of th apparatus or system according to any one of claims 1 to 8, 11 to 36,

40 to 44, 47 to 58, 61 to 64 or 66 to 73.

75. A computer program for controlling a computer to carry out the method of any one of claims 9, 37, 45, 59, 65 or 74.

76. A computer program for controlling a computer to implement the apparatus or system according to any one of claims 1 to 8, 11 to 36, 40 to 44, 47 to 58, 61 to 64 or 66 to 73.

77. A carrier medium carrying the computer program according to claims 75 or 76.

FIG. 1

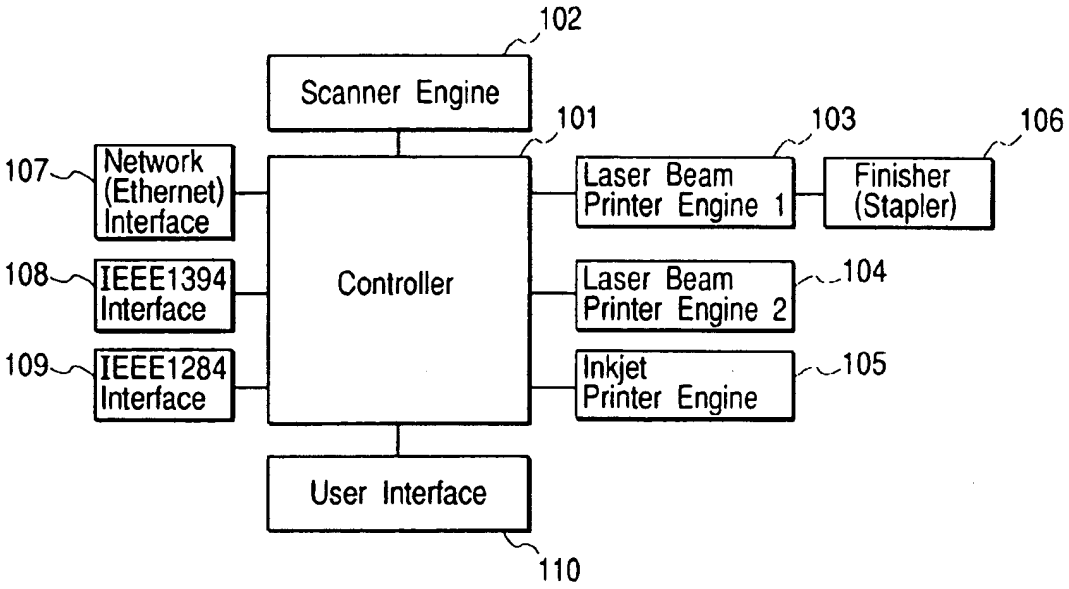

102
Scanner Engine
101
103
106
107
Network (Ethernet) Interface
Laser Beam Printer Engine 1
Finisher (Stapler)
108
IEEE1394 Interface
Controller
Laser Beam Printer Engine 2
104
109
IEEE1284 Interface
Inkjet Printer Engine
105
User Interface
110

FIG. 2

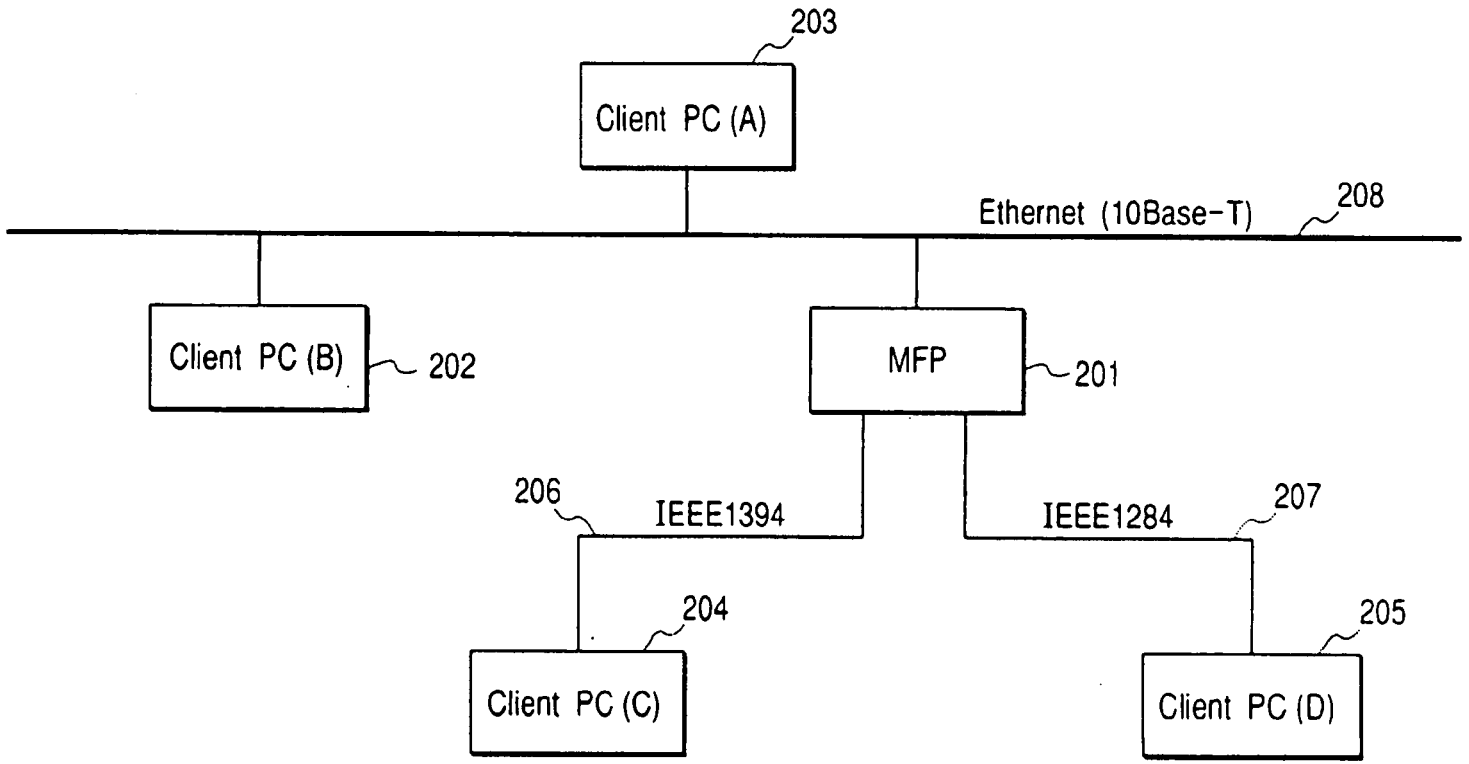

203
Client PC (A)
Ethernet (10Base-T)
208
Client PC (B)
202
MFP
201
206
IEEE1394
IEEE1284
207
204
205
Client PC (C)
Client PC (D)

FIG. 3

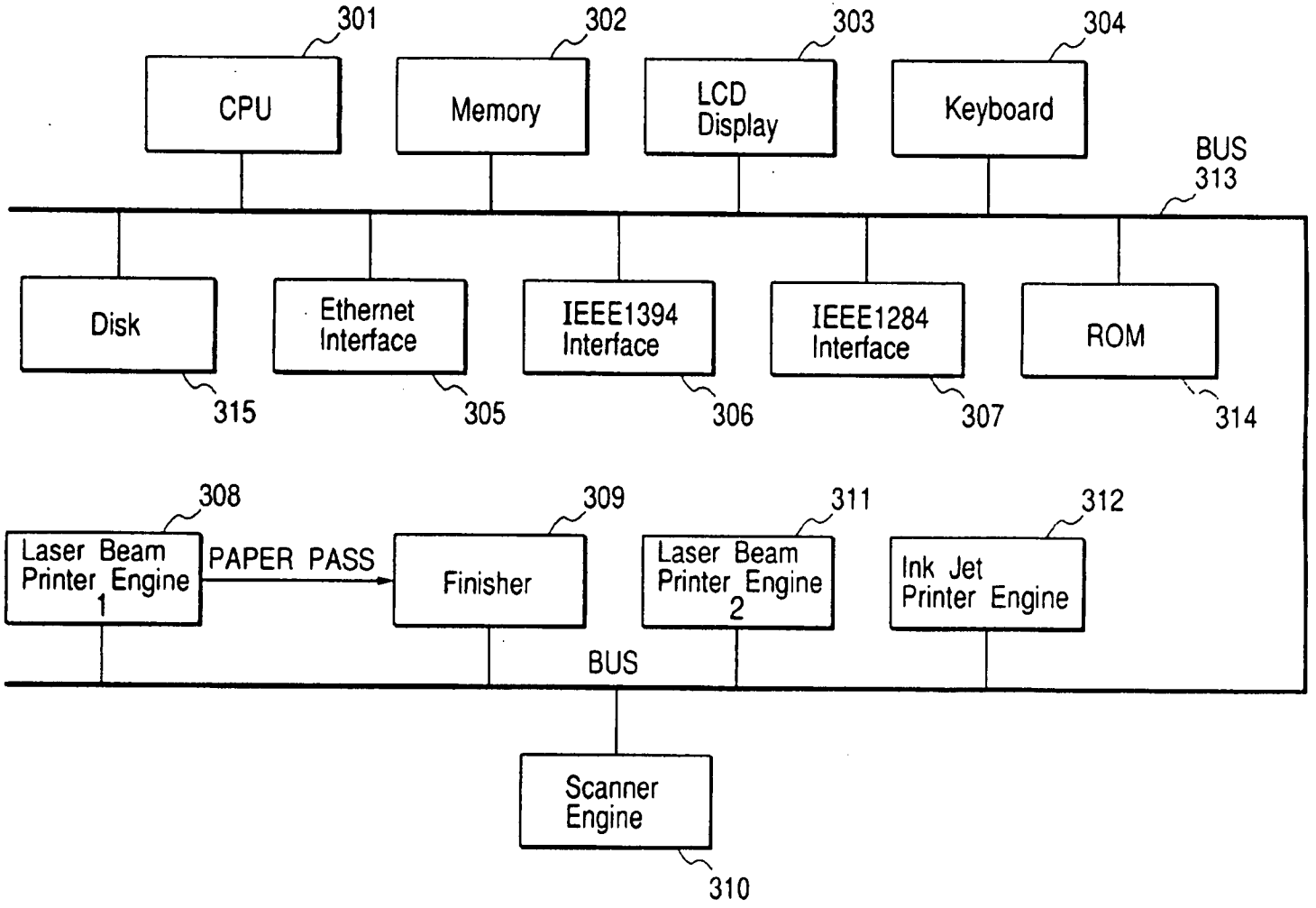

301
302
303
304
CPU
Memory
LCD Display
Keyboard
BUS
313
Disk
Ethernet Interface
IEEE1394 Interface
IEEE1284 Interface
ROM
315
305
306
307
314
308
309
311
312
Laser Beam Printer Engine 1
PAPER PASS
Finisher
Laser Beam Printer Engine 2
Ink Jet Printer Engine
BUS
Scanner Engine
310

FIG. 4

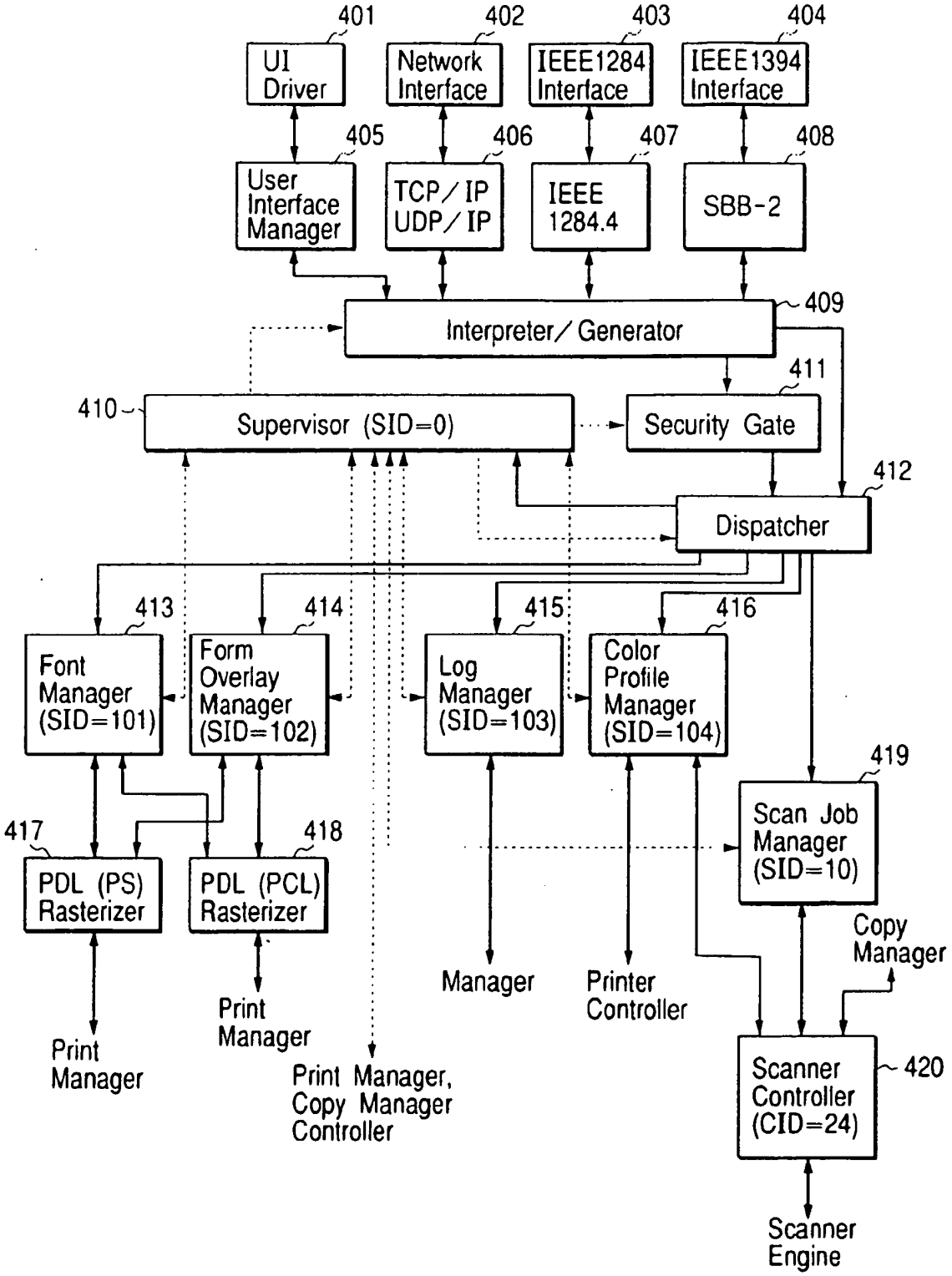

401
UI Driver
402
Network Interface
403
IEEE1284 Interface
404
IEEE1394 Interface
405
User Interface Manager
406
TCP/IP UDP/IP
407
IEEE 1284.4
408
SBB-2
409
Interpreter/Generator
410
Supervisor (SID=0)
411
Security Gate
412
Dispatcher
413
Font Manager (SID=101)
414
Form Overlay Manager (SID=102)
415
Log Manager (SID=103)
416
Color Profile Manager (SID=104)
417
PDL (PS) Rasterizer
418
PDL (PCL) Rasterizer
419
Scan Job Manager (SID=10)
420
Scanner Controller (CID=24)
Print Manager
Print Manager
Print Manager, Copy Manager Controller
Manager
Printer Controller
Copy Manager
Scanner Engine

FIG. 5

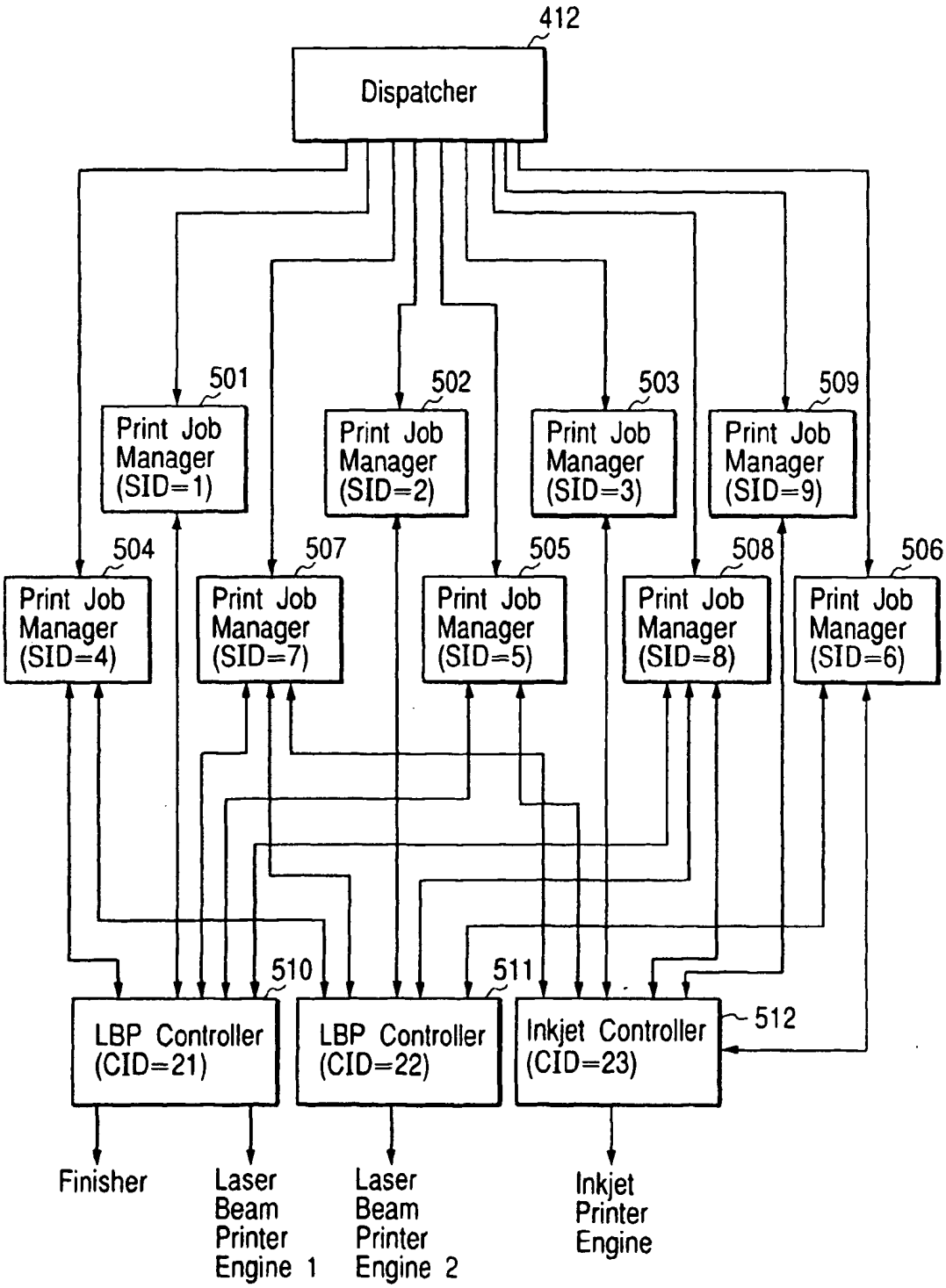

412
Dispatcher
501
Print Job Manager (SID=1)
502
Print Job Manager (SID=2)
503
Print Job Manager (SID=3)
509
Print Job Manager (SID=9)
504
Print Job Manager (SID=4)
507
Print Job Manager (SID=7)
505
Print Job Manager (SID=5)
508
Print Job Manager (SID=8)
506
Print Job Manager (SID=6)
510
LBP Controller (CID=21)
511
LBP Controller (CID=22)
Inkjet Controller (CID=23)
512
Finisher
Laser Beam Printer Engine 1
Laser Beam Printer Engine 2
Inkjet Printer Engine

FIG. 6

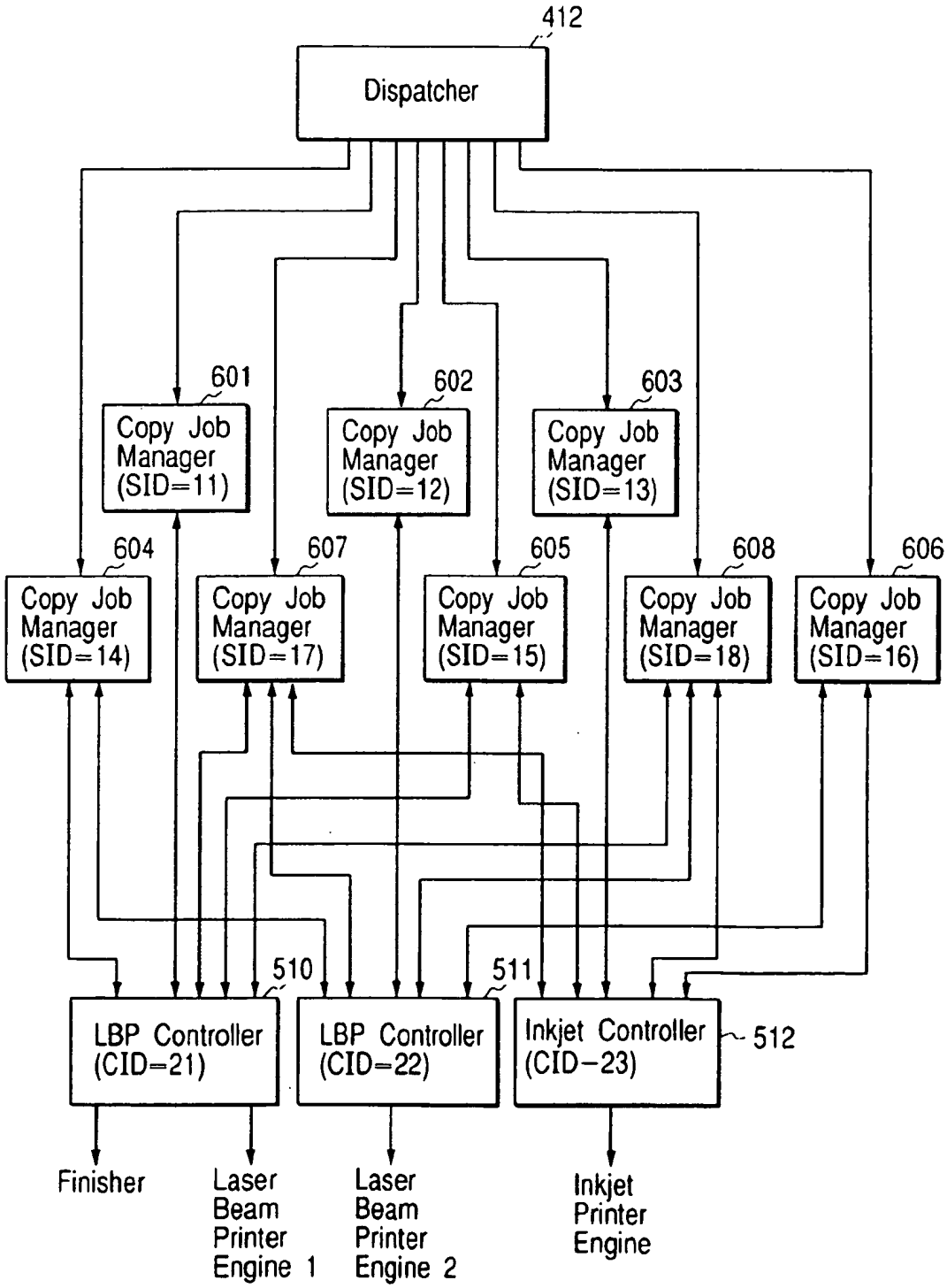
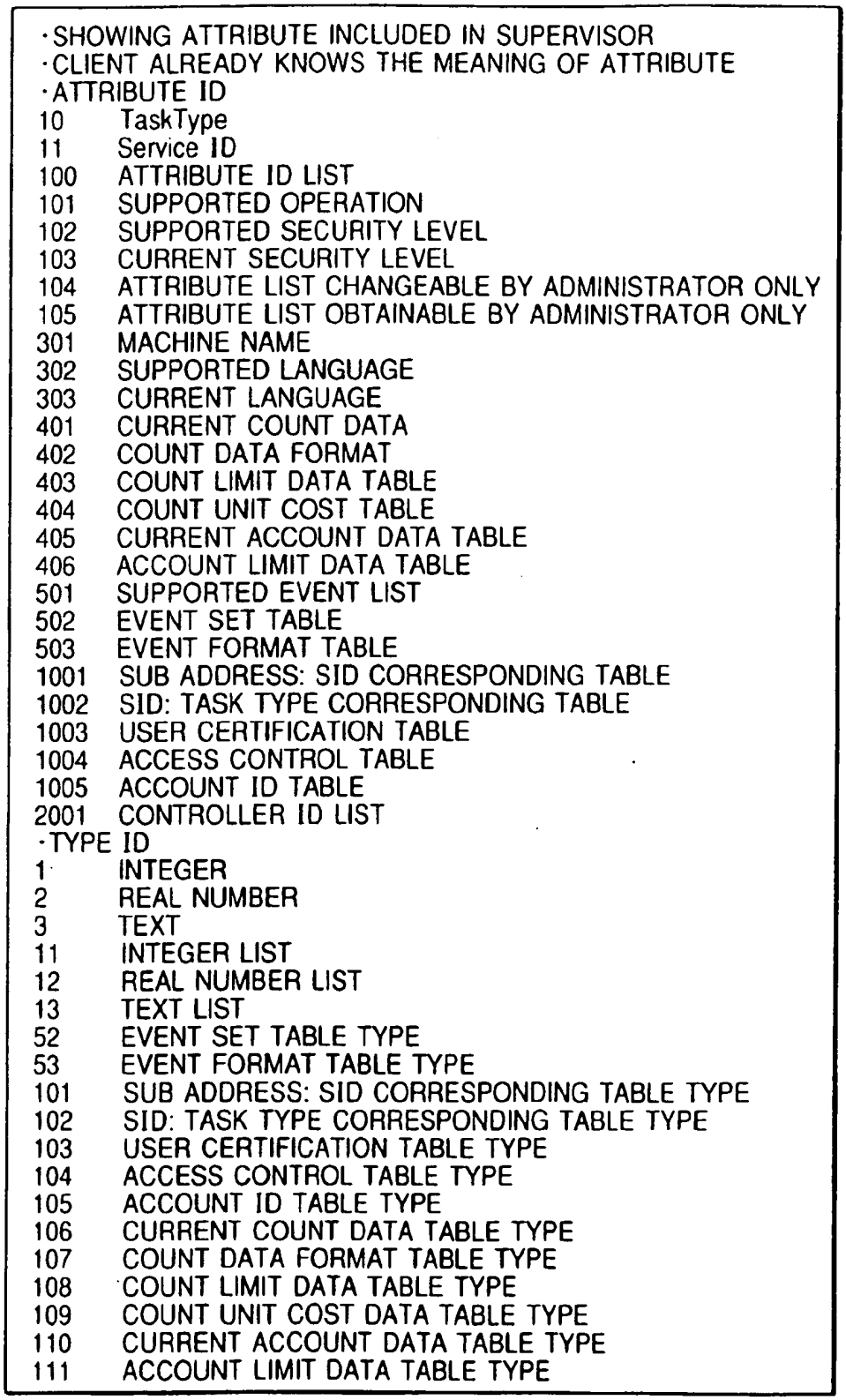

412
Dispatcher
601
Copy Job Manager (SID=11)
602
Copy Job Manager (SID=12)
603
Copy Job Manager (SID=13)
604
Copy Job Manager (SID=14)
607
Copy Job Manager (SID=17)
605
Copy Job Manager (SID=15)
608
Copy Job Manager (SID=18)
606
Copy Job Manager (SID=16)
510
511
LBP Controller (CID=21)
LBP Controller (CID=22)
Inkjet Controller (CID-23)
512
Finisher
Laser Beam Printer Engine 1
Laser Beam Printer Engine 2
Inkjet Printer Engine

FIG. 7

ATTRIBUTE TABLE (Supervisor)

701 ATTRIBUTE ID	702 TYPE ID	703 VALUE
10	1	0
11	1	0
100	11	10,11,100,101,102,103,104,···
101	11	1,2,3,7,9
102	11	1,3
103	1	1
104	11	1001,1002,1003,1004
105	11	1003
301	3	"SuperMFP-1"
302	13	"Japanese", "English"
303	1	"English"
401	106	Table Data
402	107	Table Data
403	108	Table Data
404	109	Table Data
405	110	Table Data
406	111	Table Data
501	11	200,399,432,434
502	52	Table Data
503	53	Table Data
1001	101	Table Data
1002	102	Table Data
1003	103	Table Data
1004	104	Table Data
1005	105	Table Data
2001	11	21,22,23,24

FIG. 8



・SHOWING ATTRIBUTE INCLUDED IN SUPERVISOR
・CLIENT ALREADY KNOWS THE MEANING OF ATTRIBUTE
・ATTRIBUTE ID
10 TaskType
11 Service ID
100 ATTRIBUTE ID LIST
101 SUPPORTED OPERATION
102 SUPPORTED SECURITY LEVEL
103 CURRENT SECURITY LEVEL
104 ATTRIBUTE LIST CHANGEABLE BY ADMINISTRATOR ONLY
105 ATTRIBUTE LIST OBTAINABLE BY ADMINISTRATOR ONLY
301 MACHINE NAME
302 SUPPORTED LANGUAGE
303 CURRENT LANGUAGE
401 CURRENT COUNT DATA
402 COUNT DATA FORMAT
403 COUNT LIMIT DATA TABLE
404 COUNT UNIT COST TABLE
405 CURRENT ACCOUNT DATA TABLE
406 ACCOUNT LIMIT DATA TABLE
501 SUPPORTED EVENT LIST
502 EVENT SET TABLE
503 EVENT FORMAT TABLE
1001 SUB ADDRESS: SID CORRESPONDING TABLE
1002 SID: TASK TYPE CORRESPONDING TABLE
1003 USER CERTIFICATION TABLE
1004 ACCESS CONTROL TABLE
1005 ACCOUNT ID TABLE
2001 CONTROLLER ID LIST
・TYPE ID
1 INTEGER
2 REAL NUMBER
3 TEXT
11 INTEGER LIST
12 REAL NUMBER LIST
13 TEXT LIST
52 EVENT SET TABLE TYPE
53 EVENT FORMAT TABLE TYPE
101 SUB ADDRESS: SID CORRESPONDING TABLE TYPE
102 SID: TASK TYPE CORRESPONDING TABLE TYPE
103 USER CERTIFICATION TABLE TYPE
104 ACCESS CONTROL TABLE TYPE
105 ACCOUNT ID TABLE TYPE
106 CURRENT COUNT DATA TABLE TYPE
107 COUNT DATA FORMAT TABLE TYPE
108 COUNT LIMIT DATA TABLE TYPE
109 COUNT UNIT COST DATA TABLE TYPE
110 CURRENT ACCOUNT DATA TABLE TYPE
111 ACCOUNT LIMIT DATA TABLE TYPE

FIG. 9

SUB ADDRESS : SERVICE ID CORRESPONDING TABLE

801 CONNECTION TYPE ID	802 SUB ADDRESS	803 Service ID	804 EFFECTIVE FLAG	805 EFFECTIVE USER	806 INVALID USER
0	0	0	YES		
0	1	1	YES	2355,5678	
0	2	2	YES		1234,2345
1	9600	0	YES		
1	9601	1	YES		
1	9602	2	YES	1234,2345	
1	8001	101	YES	1234	
1	8002	102	YES		
2	45	0	YES		
2	46	1	YES		
2	47	2	YES		
2	68	8	NO		
2	89	10	YES		
3	23	0	YES		
3	52	1	YES		
3	98	17	YES		

FIG. 10

- DESCRIBING TO WHICH SUB ADDRESS THE JOB SHOULD BE DESIGNATED, AT RECEIVING SERVICE
- MANAGING THE CONNECTION FORM IS AVAILABLE OR NOT (ALLOW TO USE OR NOT) BASED ON THIS TABLE
- CONNECTION FORM ID

  0 : Internal
  1 : TCP/IP
  2 : IEEE1284.4
  3 : SBB-2

FIG. 11

SERVICE ID : TASK TYPE CORRESPONDING TABLE

901 902

Service ID	Task Type
0	0
1	1
2	1
3	1
4	1
5	1
6	1
7	1
8	1
9	1
10	2
11	3
12	3
13	3
14	3
15	3
16	3
17	3
18	3
101	101
102	102
103	103
104	104
21	201
22	201
23	201
24	202

FIG. 12

- TABLE SHOWING SERVICE TYPE OF SERVICE ID
- TASK TYPE CORRESPONDS TO CPCA TASK TYPE
- THIS TABLE IS REFERRED BY DISPATCHER, AND IS USED FOR DISTRIBUTING COMMAND NAME TO EACH MANAGER
- TaskType
  - 0 : Supervisor
  - 1 : Print
  - 2 : Scan
  - 3 : Copy
  - 101 : Font
  - 102 : Form Overlay
  - 103 : Log
  - 104 : Color Profile

FIG. 13

USER CERTIFICATION TABLE

1001	1002	1003
UID	PASSWORD	ADMINISTRATOR
2355	2345	NO
3254	2223	NO
4665	1145	YES
⋮	⋮	⋮
2664	1244	NO

FIG. 14

ACCESS CONTROL TABLE

1101	1102	1103
SID	Security Level	UID
0	1	-
1	1	-
2	2	2355, 3254
3	3	3254, 4665
⋮	⋮	⋮
102	2	3254

FIG. 15

- SHOWING SECURITY LEVEL FOR EACH SERVICE

- Security Level
  - 0 : DISCRIMINATE NOTHING
  - 1 : DISCRIMINATE ADMINISTRATOR ONLY
  - 2 : AVAILABLE FOR CERTIFIED USER ONLY (USING ONLY UID FOR CERTIFICATION)
  - 3 : AVAILABLE FOR CERTIFIED USER ONLY (USING UID AND PASSWORD / PASSWORD FOR CERTIFICATION)

- ROW OF UID IN TABLE IS USED ONLY FOR SECURITY LEVEL 2 OR 3

FIG. 16

EVENT SET TABLE (Supervisor)

1201 Event ID	1202 CONNECTION FORM ID	1203 NOTICE DESTINATION ADDRESS
200	0	
399	1	123, 222, 111, 321 : 9340
432	2	35
234	3	12

FIG. 17

EVENT FORMAT TABLE

1301 Event ID	1302 EVENT FORMAT
200	676, 756
399	666
432	698
234	600

FIG. 18

ATTRIBUTE TABLE (Print Job Manager)

1401 ATTRIBUTE TABLE	1402 TYPE ID	1403 VALUE
10	1	1
11	1	4
100	11	10,11,100,101,104,401,···
101	11	11,14,15,17
104	11	1104,1105,
106	1	1
107	11	10001
108	11	
401	106	Table Data
402	107	Table Data
403	108	Table Data
404	109	Table Data
405	110	Table Data
406	111	Table Data
501	11	200,399,432,434
502	52	Table Data
601	11	1,2
801	81	4354:{3254,2464,2456},4356:{124,535,6}
802	82	(3254: 1: 4324) {43143,2342,6543,3245}
803	83	(5425: 2: 25432): {(34324: 2 :12453),(3424: 2: 2343)}
804	84	(5425: 2: 25432): 4: (5425: 5: 655): {2435,563}
805	85	(2414: 3: 43291): 5: (3243: 2: 3214) {(455: 2: 1535),(1584: 1:11534)}
1011	11	3,5
1102	0	NO
1103	11	1,2
1104	1	400
1105	1	100
2001	11	21,22
2002	0	NO
2003	203	Table Data
2004	204	Table Data
2005	205	Table Data
2006	206	Table Data
10001	1	10

FIG. 19

·SHOWING ATTRIBUTE INCLUDED IN PRINT JOB MANAGER
·CLIENT ALREADY KNOWS MEANING OF ATTRIBUTE ID
·ATTRIBUTE ID

10	TaskType
11	Service ID
100	ATTRIBUTE ID LIST
101	OPERATION SUPPORTED WITH JOB SCR I PT
104	ATTRIBUTE LIST CHANGEABLE BY ADMINISTRATOR ONLY
106	CURRENT STATUS
107	ATTRIBUTE LIST TO BE REFERRED WHEN JOB CAN BE EXECUTED WITH RESTRICTION
108	REASON FOR TROUBLE
401	CURRENT COUNT DATA TABLE
402	COUNT DATA FORMAT TABLE
403	COUNT LIMIT DATA TABLE
404	COUNT UNIT COST DATA TABLE
405	CURRENT ACCOUNT DATA TABLE
406	ACCOUNT LIMIT DATA TABLE
501	SUPPORTED EVENT LIST
502	EVENT SET TABLE
601	SUPPORTED DATA DOWN LOAD PROCESS
801	LIST OF ATTRIBUTE COMBINATION BEING PROHIBITED TO SET (TYPE 1)
802	LIST OF ATTRIBUTE COMBINATION BEING PROHIBITED TO SET (TYPE 2)
803	LIST OF ATTRIBUTE COMBINATION BEING PROHIBITED TO SET (TYPE 3)
804	LIST OF ATTRIBUTE COMBINATION BEING PROHIBITED TO SET (TYPE 4)
805	LIST OF ATTRIBUTE COMBINATION BEING PROHIBITED TO SET (TYPE 5)
1101	SUPPORTED PDL LIST
1102	COLOR PRINT AVAILABLE OR NOT
1103	KIND OF SUPPORTED FINISHING
1104	SETTABLE MAX RESOLUTION
1105	SETTABLE MIN RESOLUTION
2001	LIST OF CONTROLLER ID FOR EXECUTING JOB
2002	CONTROLLER AUTOMATICALLY SELECTABLE OR NOT
2003	JOB TABLE
2004	JOB REQUEST TABLE
2005	BINDER TABLE
2006	DOCUMENT TABLE
10001	MAX PRINTABLE NUMBER OF COPIES

·TYPE ID

0	Boolean
1	INTEGER
2	REAL NUMBER LIST
3	TEXT
11	INTEGER LIST
12	REAL NUMBER LIST
13	TEXT LIST
52	EVENT SET TABLE TYPE
81	PROHIBITED ATTRIBUTE COMBINATION LIST TYPE 1
82	PROHIBITED ATTRIBUTE COMBINATION LIST TYPE 2
83	PROHIBITED ATTRIBUTE COMBINATION LIST TYPE 3
106	CURRENT COUNT DATA TABLE TYPE
107	COUNT DATA FORMAT TABLE TYPE
108	COUNT LIMIT DATA TABLE TYPE
109	COUNT UNIT COST DATA TABLE TYPE
110	CURRENT ACCOUNT DATA TABLE TYPE
111	ACCOUNT LIMIT DATA TABLE TYPE
203	JOB TABLE TYPE
204	JOB REQUEST TABLE TYPE
205	BINDER TABLE TYPE
206	DOCUMENT TABLE TYPE

FIG. 20

JOB TABLE

1501 Job ID	1502 Job File Name
1	P0001
2	P1001
3	P2001

FIG. 21

JOB REQUEST TABLE

1503 Job ID	1504 Control ID	1505 Job ID
1	21	100
1	22	101
2	21	102
2	22	403
3	-	-

FIG. 22

ATTRIBUTE TABLE (Scan Job Manager)

1601 ATTRIBUTE ID	1602 TYPE ID	1603 VALUE
10	1	2
11	1	10
100	11	10,11,100,101,104,401,···
101	11	21,22,25,29
104	11	602
106	1	0
107	11	
108	11	
401	106	Table Data
402	107	Table Data
403	108	Table Data
404	109	Table Data
405	110	Table Data
406	111	Table Data
501	11	200,399,432,434
502	52	Table Data
602	11	1,2
1201	11	3,5
1202	0	YES
1203	11	100,200,300,400
1204	11	1,2,5,7
2001	11	24
2002	0	NO
2003	203	Table Data
2005	205	Table Data
2006	206	Table Data

FIG. 23

·SHOWING ATTRIBUTE INCLUDED IN SCAN JOB MANAGER
·CLIENT ALREADY KNOWS MEANING OF ATTRIBUTE ID
·ATTRIBUTE ID

10	TaskType
11	Service ID
100	ATTRIBUTE ID LIST
101	OPERATION SUPPORTED WITH JOB SCRIPT
104	ATTRIBUTE LIST CHANGEABLE BY ADMINISTRATOR ONLY
106	CURRENT STATUS
107	ATTRIBUTE LIST TO BE REFERRED WHEN JOB CAN BE EXECUTED WITH RESTRICTION
108	REASON FOR TROUBLE
401	CURRENT COUNT DATA TABLE
402	COUNT DATA FORMAT TABLE
403	COUNT LIMIT DATA TABLE
404	COUNT UNIT COST DATA TABLE
405	CURRENT ACCOUNT DATA TABLE
406	ACCOUNT LIMIT DATA TABLE
501	SUPPORTED EVENT LIST
502	EVENT SET TABLE
602	SUPPORTED DATA UP LOAD PROCESS
1201	SUPPORTED IMAGE FORMAT LIST
1202	COLOR SCAN AVAILABLE OR NOT
1203	SETTABLE RESOLUTION LIST
1204	DISTINGUISHABLE ORIGINAL TYPE
2001	LIST OF CONTROLLER ID FOR EXECUTING JOB
2002	CONTROLLER AUTOMATICALLY SELECTABLE OF NOT
2003	JOB TABLE
2005	BINDER TABLE
2006	DOCUMENT TABLE

·TYPE ID

0	Boolean
1	INTEGER
2	REAL NUMBER LIST
3	TEXT
11	INTEGER LIST
12	REAL NUMBER LIST
13	TEXT LIST
52	EVENT SET TABLE TYPE
106	CURRENT COUNT DATA TABLE TYPE
107	COUNT DATA FORMAT TABLE TYPE
108	COUNT LIMIT DATA TABLE TYPE
109	COUNT UNIT COST DATA TABLE TYPE
110	CURRENT ACCOUNT DATA TABLE TYPE
111	ACCOUNT LIMIT DATA TABLE TYPE
203	JOB TABLE TYPE
205	BINDER TABLE TYPE
206	DOCUMENT TABLE TYPE

FIG. 24

ATTRIBUTE TABLE (Copy Job Manager)

112a01 ATTRIBUTE ID	112a02 TYPE ID	112a03 VALUE
10	1	3
11	1	18
100	11	10,11,100,101,104,401,···
101	11	31,32,35
104	11	1304,1305
106	1	1
107	11	
108	11	
401	106	Table Data
402	107	Table Data
403	108	Table Data
404	109	Table Data
405	110	Table Data
406	111	Table Data
501	11	200,399,432,434
502	52	Table Data
1302	0	NO
1303	11	1, 2,
1304	1	400
1305	1	100
2001	11	21,22,23,24
2002	0	YES
2003	203	Table Data
2004	204	Table Data
2005	205	Table Data
2006	206	Table Data
10001	1	100

FIG. 25

·SHOWING ATTR IBUTE INCLUDED IN COPY JOB MANAGER
·CLIENT ALREADY KNOWS MEANING OF ATTRIBUTE ID
·ATTRIBUTE ID

10	TaskType
11	Service ID
100	ATTRIBUTE ID LIST
101	OPERATION SUPPORTED WITH JOB SCRIPT
104	ATTRIBUTE LIST CHANGEABLE BY ADMINISTRATOR ONLY
106	CURRENT STATUS
107	ATTRIBUTE LIST TO BE REFERRED WHEN JOB CAN BE EXECUTED WITH RESTRICTION
108	REASON FOR TROUBLE
401	CURRENT COUNT DATA TABLE
402	COUNT DATA FORMAT TABLE
403	COUNT LIMIT DATA TABLE
404	COUNT UNIT COST DATA TABLE
405	CURRENT ACCOUNT DATA TABLE
406	ACCOUNT LIMIT DATA TABLE
501	SUPPORTED EVENT LIST
502	EVENT SET TABLE
1302	COLOR PRINT AVAILABLE OR NOT
1303	SUPPORTED FINISHING TYPE
1304	MAX SETTABLE RESOLUTION
1305	MIN SETTABLE RESOLUTION
2001	LIST OF CONTROLLER ID FOR EXECUTING JOB
2002	CONTROLLER AUTOMATICALLY SETTABLE OR NOT
2003	JOB TABLE
2004	BINDER TABLE
2005	DOCUMENT TABLE
2006	JOB REQUEST TABLE
10001	MAX PRINTABLE NUMBER OF COPIES

·TYPE ID

1	INTEGER
2	REAL NUMBER LIST
3	TEXT
11	INTEGER LIST
12	REAL NUMBER LIST
13	TEXT LIST
52	EVENT SET TABLE TYPE
106	CURRENT COUNT DATA TABLE TYPE
107	COUNT DATA FORMAT TABLE TYPE
108	COUNT LIMIT DATA TABLE TYPE
109	COUNT UNIT COST DATA TABLE TYPE
110	CURRENT ACCOUNT DATA TABLE TYPE
111	ACCOUNT LIMIT DATA TABLE TYPE
203	JOB TABLE TYPE
204	JOB REQUEST TABLE TYPE
205	BINDER TABLE TYPE
206	DOCUMENT TABLE TYPE

FIG. 26

ATTRIBUTE TABLE (Font Manager)

1801 ATTRIBUTE ID	1802 TYPE ID	1803 VALUE
10	1	101
11	1	101
100	11	10,11,100,101,104,401,···
101	11	110,111,112
104	11	
106	1	0
107	11	
108	11	
401	106	Table Data
402	107	Table Data
403	108	Table Data
404	109	Table Data
405	110	Table Data
406	111	Table Data
501	11	200,399,432,434
502	52	Table Data
601	11	1,2
602	11	1,2
1501	11	3,5
1502	1	10
1503	1	3
1504	150	Table Data
2003	203	Table Data

FIG. 27

·SHOWING ATTRIBUTE INCLUDED IN FONT MANAGER
·CLIENT ALREADY KNOWS MEANING OF ATTRIBUTE ID

·ATTRIBUTE ID
10 TaskType
11 Service ID
100 ATTRIBUTE ID LIST
101 OPERATION SUPPORTED WITH JOB SCRIPT
104 ATTRIBUTE LIST CHANGEABLE BY ADMINISTRATOR ONLY
106 CURRENT STATUS
107 ATTRIBUTE LIST TO BE REFERRED WHEN JOB CAN BE EXECUTED WITH RESTRICTION
108 REASON FOR TROUBLE
401 CURRENT COUNT DATA TABLE
402 COUNT DATA FORMAT TABLE
403 COUNT LIMIT DATA TABLE
404 COUNT UNIT COST DATA TABLE
405 CURRENT ACCOUNT DATA TABLE
406 ACCOUNT LIMIT DATA TABLE
501 SUPPORTED EVENT LIST
502 EVENT SET TABLE
601 SUPPORTED DATA DOWN LOAD PROCESS
602 SUPPORTED DATA UP LOAD PROCESS
1501 SUPPORTED FONT TYPE LIST
1502 MAX STORABLE NUMBER OF FONTS
1503 OURRENT NUMBER OF FONTS
1504 STORED FONT LIST
2003 JOB TABLE

·TYPE ID
0 Boolean
1 INTEGER
2 REAL NUMBER LIST
3 TEXT
11 INTEGER LIST
12 REAL NUMBER LIST
13 TEXT LIST
52 EVENT SET TABLE TYPE
106 CURRENT COUNT DATA TABLE TYPE
107 COUNT DATA FORMAT TABLE TYPE
108 COUNT LIMIT DATA TABLE TYPE
109 COUNT UN IT COST DATA TABLE TYPE
110 CURRENT ACCOUNT DATA TABLE TYPE
111 ACCOUNT LIMIT DATA TABLE TYPE
150 FONT TABLE TYPE
203 JOB TABLE TYPE

FIG. 28

FONT TABLE

1901 Font ID	1902 Font Type	1902 Font NAME	1903 Font Data File NAME
1	1	Gothic	1500
2	2	Times	1501
3	1	Helvetica	1502

FIG. 29

ATTRIBUTE TABLE (Form Overlay Manager)

2001 ATTRIBUTE ID	2002 TYPE ID	2003 VALUE
10	1	102
11	1	102
100	11	10,11,100,101,104,401,···
101	11	110,111,112
104	11	
106	1	0
107	11	
108	11	
401	106	Table Data
402	107	Table Data
403	108	Table Data
404	109	Table Data
405	110	Table Data
406	111	Table Data
501	11	200,399,432,434
502	52	Table Data
601	11	1,2
602	1	1,2
1601	11	1,2
1602	1	10
1603	1	3
1604	160	Table Data
2003	203	Table Data

FIG. 30

·SHOWING ATTRIBUTE INCLUDED IN FORM OVERLAY MANAGER
·CLIENT ALREADY KNOWS MEANING OF ATTRIBUTE ID

·ATTRIBUTE ID
10 TaskType
11 Service ID
100 ATTRIBUTE ID LIST
101 OPERATION SUPPORTED WITH JOB SCRIPT
104 ATTRIBUTE LIST CHANGEABLE BY ADMINISTRATOR ONLY
106 CURRENT STATUS
107 ATTRIBUTE LIST TO BE REFERRED WHEN JOB CAN BE EXECUTED WITH RESTRICTION
108 REASON FOR TROUBLE
401 CURRENT COUNT DATA TABLE
402 COUNT DATA FORMAT TABLE
403 COUNT LIMIT DATA TABLE
404 COUNT UNIT COST DATA TABLE
405 CURRENT ACCOUNT DATA TABLE
406 ACCOUNT LIMIT DATA TABLE
501 SUPPORTED EVENT LIST
502 EVENT SET TABLE
601 SUPPORTED DATA DOWN LOAD PROCESS
602 SUPPORTED DATA UP LOAD PROCESS
1601 SUPPORTED FORMAT LIST
1602 MAX STORABLE NUMBER OF FORMS
1603 CURRENT FORM LIST
1604 STORED FORM LIST
2003 JOB TABLE

·TYPE ID
0 Boolean
1 INTEGER
2 REAL NUMBER LIST
3 TEXT
11 INTEGER LIST
12 REAL NUMBER LIST
13 TEXT LIST
52 EVENT SET TABLE TYPE
106 CURRENT COUNT DATA TABLE TYPE
107 COUNT DATA FORMAT TABLE TYPE
108 COUNT LIMIT DATA TABLE TYPE
109 COUNT UNIT COST DATA TABLE TYPE
110 CURRENT ACCOUNT DATA TABLE TYPE
111 ACCOUNT LIMIT DATA TABLE TYPE
160 FORM TABLE TYPE
203 JOB TABLE TYPE

FIG. 31

FORM TABLE

2101 Font ID	2102 Format	2103 Form NAME	2104 Form Data File NAME
1	1	Confidential	1600
2	2	Reference	1601
3	1	Logo	1602

FIG. 32

ATTRIBUTE TABLE (Log Manager)

2201 ATTRIBUTE ID	2202 TYPE ID	2203 VALUE
10	1	103
11	1	103
100	11	10,11,100,101,104,401,···
101	11	110,111,112
104	11	
106	1	0
107	11	
108	11	
401	106	Table Data
402	107	Table Data
403	108	Table Data
404	109	Table Data
405	110	Table Data
406	111	Table Data
501	11	200,399,432,434
502	52	Table Data
602	11	1,2
1703	1	3
1704	170	Table Data
1705	171	Table Data
1706	11	2,3,4
1707	172	Table Data
2003	203	Table Data

FIG. 33

·SHOWING ATTRIBUTE INCLUDED IN LOG MANAGER
·CLIENT ALREADY KNOWS MEANING OF ATTRIBUTE ID

·ATTRIBUTE ID
10 TaskType
11 Service ID
100 ATTRIBUTE ID LIST
101 OPERATION SUPPORTED WITH JOB SCRIPT
104 ATTRIBUTE LIST CHANGEABLE BY ADMINISTRATOR ONLY
106 CURRENT STATUS
107 ATTRIBUTE LIST TO BE REFERRED WHEN JOB CAN BE EXECUTED WITH RESTRICTION
108 REASON FOR TROUBLE
401 CURRENT COUNT DATA TABLE
402 COUNT DATA FORMAT TABLE
403 COUNT LIMIT DATA TABLE
404 COUNT UNIT COST DATA TABLE
405 CURRENT ACCOUNT DATA TABLE
406 ACCOUNT LIMIT DATA TABLE
501 SUPPORTED EVENT LIST
502 EVENT SET TABLE
602 SUPPORTED DATA UP LOAD PROCESS
1703 THE NUMBER OF STORED LOGS
1704 STORED LOG LIST
1705 LOG FORMAT TABLE
1706 ACTION LIST DESIGNATABLE WHEN LOG BUFFER IS FULL
1707 LOG DATA FILE ATTRIBUTE TABLE
2003 JOB TABLE

·TYPE ID
0 Boolean
1 INTEGER
2 REAL NUMBER LIST
3 TEXT
11 INTEGER LIST
12 REAL NUMBER LIST
13 TEXT LIST
52 EVENT SET TABLE TYPE
106 CURRENT COUNT DATA TABLE TYPE
107 COUNT DATA FORMAT TABLE TYPE
108 COUNT LIMIT DATA TABLE TYPE
109 COUNT UNIT COST DATA TABLE TYPE
110 CURRENT AOCOUNT DATA TABLE TYPE
111 ACCOUNT LIMIT DATA TABLE TYPE
170 LOG TABLE TYPE
171 LOG FORMAT TABLE TYPE
172 LOG DATA FILE ATTRIBUTE TABLE TYPE
203 JOB TABLE TYPE

FIG. 34

LOG TABLE

2301 Log ID	2302 Log Data File NAME
1	1700
2	1701
3	1702

FIG. 35

LOG DATA CONTENTS (FILE NAME : 1700)

2401 Log Format ID	2402 Date / Time	2403 VALUE
1	98 / 1/3 1 : 23	12345, 4, 1.23, "OK"
2	98 / 1/3 1 : 25	22345, 12, 4.22, "OK"
1	98 / 1/3 1 : 43	98763, 11, 3.45, "Canceled"
2	98 / 1/3 2 : 33	77623, 5, 1.44, "NG"
1	98 / 1/3 3 : 32	12346, 5, 1.66, "OK"

FIG. 36

LOG FORMAT TABLE

2501 Log Format ID	2502 FORMAT
1	1 : 701, 1 : 565, 1 : 765, 1 :777
2	11 : 701, 11 : 565, 11 : 765, 11 :777

FIG. 37

ATTRIBUTE TABLE (Color Profile Manager)

2601 ATTRIBUTE ID	2602 TYPE ID	2603 VALUE
10	1	102
11	1	102
100	11	10,11,100,101,104,401,···
101	11	110,111,112
104	11	
106	1	0
107	11	
108	11	
401	106	Table Data
402	107	Table Data
403	108	Table Data
404	109	Table Data
405	110	Table Data
406	111	Table Data
501	11	200,399,432,434
502	52	Table Data
601	11	1,2
602	11	1,2
1801	11	3,5
1802	1	10
1803	1	3
1804	180	Table Data
2003	203	Table Data

FIG. 38

・SHOWING ATTRIBUTE INCLUDED IN COLOR PROFILE MANAGER
・CLIENT ALREADY KNOWS MEANING OF ATTRIBUTE ID

・ATTRIBUTE ID
10 TaskType
11 Service ID
100 ATTRIBUTE ID LIST
101 OPERATION SUPPORTED WITH JOB SCRIPT
104 ATTRIBUTE LIST CHANGEABLE BY ADMINISTRATOR ONLY
106 CURRENT STATUS
107 ATTRIBUTE LIST TO BE REFERRED WHEN JOB CAN BE EXECUTED WITH RESTRICTION
108 REASON FOR TROUBLE
401 CURRENT COUNT DATA TABLE
402 COUNT DATA FORMAT TABLE
403 COUNT LIMIT DATA TABLE
404 COUNT UNIT COST DATA TABLE
405 CURRENT ACCOUNT DATA TABLE
406 ACCOUNT LIMIT DATA TABLE
501 SUPPORTED EVENT LIST
502 EVENT SET TABLE
601 SUPPORTED DATA DOWN LOAD PROCESS
602 SUPPORTED DATA UP LOAD PROCESS
1801 SUPPORTED FORMAT LIST
1802 MAX STORABLE NUMBER OF PROFILE
1803 CURRENT NUMBER OF COLOR PROFILE
1804 STORED COLOR PROFILE LIST
2003 JOB LIST
・TYPE ID
0 Boolean
1 INTEGER
2 REAL NUMBER LIST
3 TEXT
11 INTEGER LIST
12 REAL NUMBER LIST
13 TEXT LIST
52 EVENT SET TABLE TYPE
106 CURRENT COUNT DATA TABLE TYPE
107 COUNT DATA FORMAT TABLE TYPE
108 COUNT LIMIT DATA TABLE TYPE
109 COUNT UNIT COST DATA TABLE TYPE
110 CURRENT ACCOUNT DATA TABLE TYPE
111 ACCOUNT LIMIT DATA TABLE TYPE
180 COLOR PROFILE TABLE TYPE
203 JOB TABLE TYPE

FIG. 39

COLOR PROFILE TABLE

2701 Profile ID	2702 Format	2703 Profile Data File NAME
1	3	1800
2	5	1801
3	3	1802

FIG. 40

ATTRIBUTE TABLE (Printer Controller)

2801 ATTRIBUTE ID	2802 TYPE ID	2803 VALUE
12	1	1
13	1	21
100	11	12,13,104,···
104	11	
401	106	Table Data
402	107	Table Data
403	108	Table Data
404	109	Table Data
405	110	Table Data
406	111	Table Data
501	11	200,399,432,434
502	52	Table Data
2000	200	Table Data
5001	0	NO
5002	11	1,2,3
5003	1	1200
5004	1	100

FIG. 41

·SHOWING ATTRIBUTE INCLUDED IN PRINT CONTROLLER MANAGER
·CLIENT ALREADY KNOWS MEANING OF ATTRIBUTE ID

·ATTRIBUTE ID

12	Controller Type
13	Controller ID
100	ATTRIBUTE ID LIST
104	ATTRIBUTE LIST CHANGEABLE BY ADMINISTRATOR ONLY
401	CURRENT COUNT DATA TABLE
402	COUNT DATA FORMAT TABLE
403	COUNT LIMIT DATA TABLE
404	COUNT UNIT COST DATA TABLE
405	CURRENT ACCOUNT DATA TABLE
406	ACCOUNT LIMIT DATA TABLE
501	SUPPORTED EVENT LIST
502	EVENT SET TABLE
2000	JOB QUEUE TABLE
5001	COLOR PRINT AVAILABLE OR NOT
5002	KIND OR SUPPORTED FINISHING
5003	MAX SETTABLE RESOLUTION
5004	MIN SETTABLE RESOLUTION

·TYPE ID

0	Boolean
1	INTEGER
2	REAL NUMBER LIST
3	TEXT
11	INTEGER LIST
12	REAL NUMBER LIST
13	TEXT LIST
52	EVENT SET TABLE TYPE
106	CURRENT COUNT DATA TABLE TYPE
107	COUNT DATA FORMAT TABLE TYPE
108	COUNT LIMIT DATA TABLE TYPE
109	COUNT UNIT COST DATA TABLE TYPE
110	CURRENT ACCOUNT DATA TABLE TYPE
111	ACCOUNT LIMIT DATA TABLE TYPE
200	JOB QUEUE TABLE TYPE

FIG. 42

JOB QUEUE TABLE

2901	2902	2903
Job ID	Status	File Name
100	1	C100
101	2	C101
102	3	C102
103	3	C103
104	3	C104
105	3	C105

FIG. 43

- LIST OF EXECUTED JOB IN PRINT CONTROLLER AND JOB IN QUEUE
- MEANING OF STATUS
  - 1 : EXECUTION COMPLETED
  - 2 : EXECUTING IN ENGINE
  - 3 : WAITING EXECUTION

FIG. 44

ATTRIBUTE TABLE (Scanner Controller)

3001 ATTRIBUTE ID	3002 TYPE ID	3003 VALUE
12	1	2
13	1	24
100	11	12,13,104,···
104	11	
401	106	Table Data
402	107	Table Data
403	108	Table Data
404	109	Table Data
405	110	Table Data
406	111	Table Data
501	11	200,399,432,434
502	52	Table Data
2000	200	Table Data
6001	0	YES
6002	12	200.00,300.00
6003	1	1200
6004	1	100

FIG. 45

·SHOWING ATTRIBUTE INCLUDED IN SCANNER CONTROLLER
·CLIENT ALREADY KNOWS MEANING OF ATTRIBUTE ID

·ATTRIBUTE ID

12	Controller Type
13	Controller ID
100	ATTRIBUTE ID LIST
104	ATTRIBUTE LIST CHANGEABLE BY ADMINISTRATOR ONLY
401	CURRENT COUNT DATA TABLE
402	COUNT DATA FORMAT TABLE
403	COUNT LIMIT DATA TABLE
404	COUNT UNIT COST DATA TABLE
405	CURRENT AOCOUNT DATA TABLE
406	ACCOUNT LIMIT DATA TABLE
501	SUPPORTED EVENT LIST
502	EVENT SET TABLE
2000	JOB QUEUE TABLE
6001	COLOR SCANNING AVAILABLE OR NOT
6002	MAX ORIGINAL SIZE
6003	MAX SETTABLE RESOLUTION
6004	MIN SETTABLE RESOLUTION

·TYPE ID

0	Boolean
1	INTEGER
2	REAL NUMBER LIST
3	TEXT
11	INTEGER LIST
12	REAL NUMBER LIST
13	TEXT LIST
52	EVENT SET TABLE TYPE
106	CURRENT COUNT DATA TABLE TYPE
107	COUNT DATA FORMAT TABLE TYPE
108	COUNT LIMIT DATA TABLE TYPE
109	COUNT UNIT COST DATA TABLE TYPE
110	CURRENT ACCOUNT DATA TABLE TYPE
111	ACCOUNT LIMIT DATA TABLE TYPE
200	JOB QUEUE TABLE TYPE

FIG. 46

COMMAND PACKET STRUCTURE

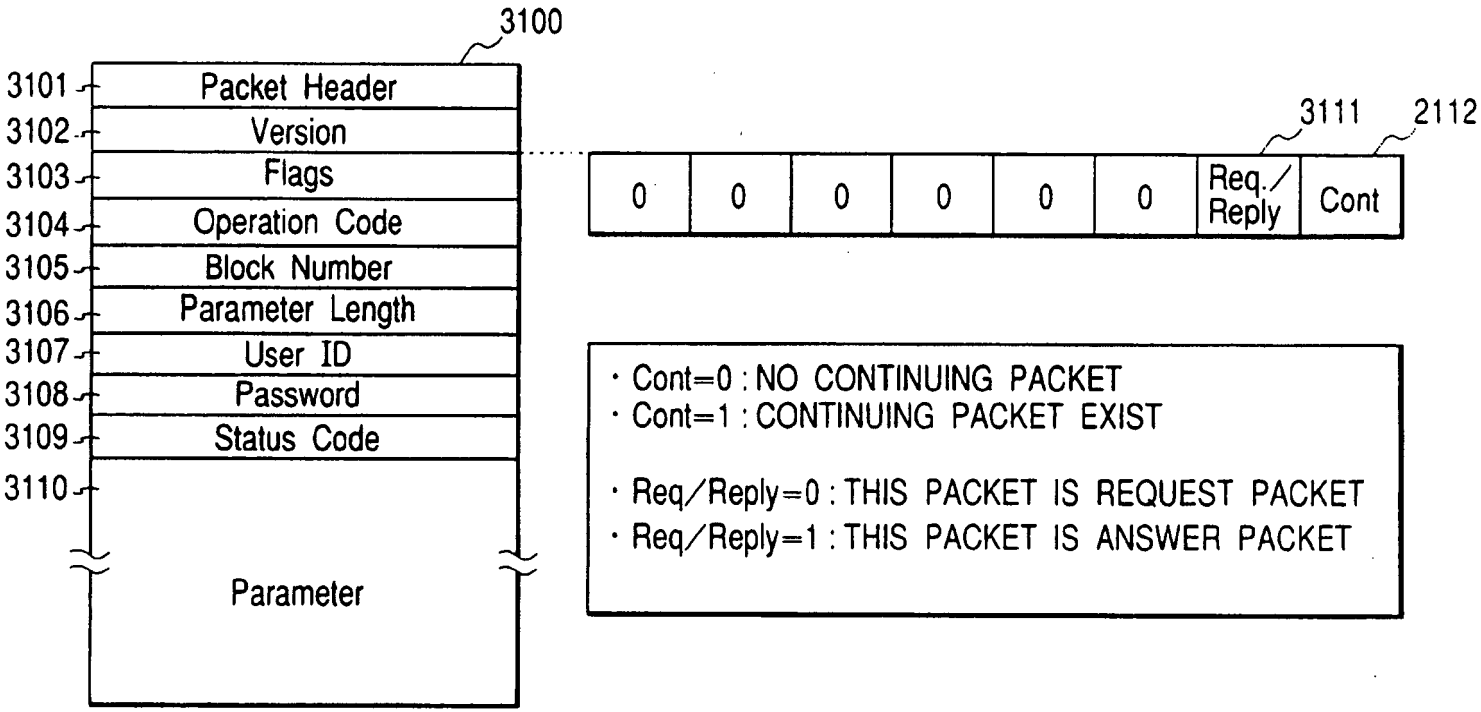


FIG. 47

FLOW CHART OF COMMAND PACKET PROCESS

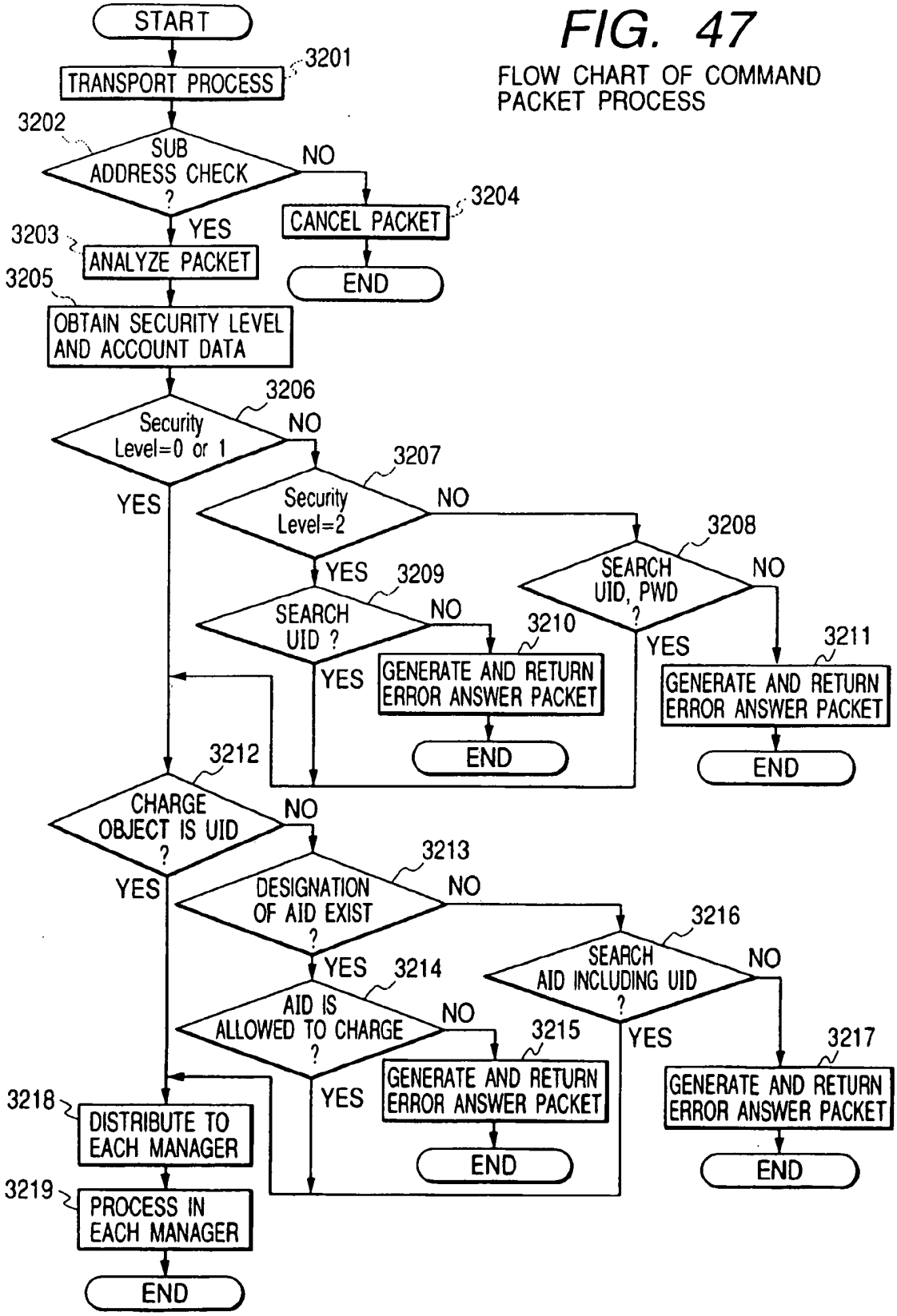


FIG. 48

FLOW CHART OF ATTRIBUTE TABLE ACCESS

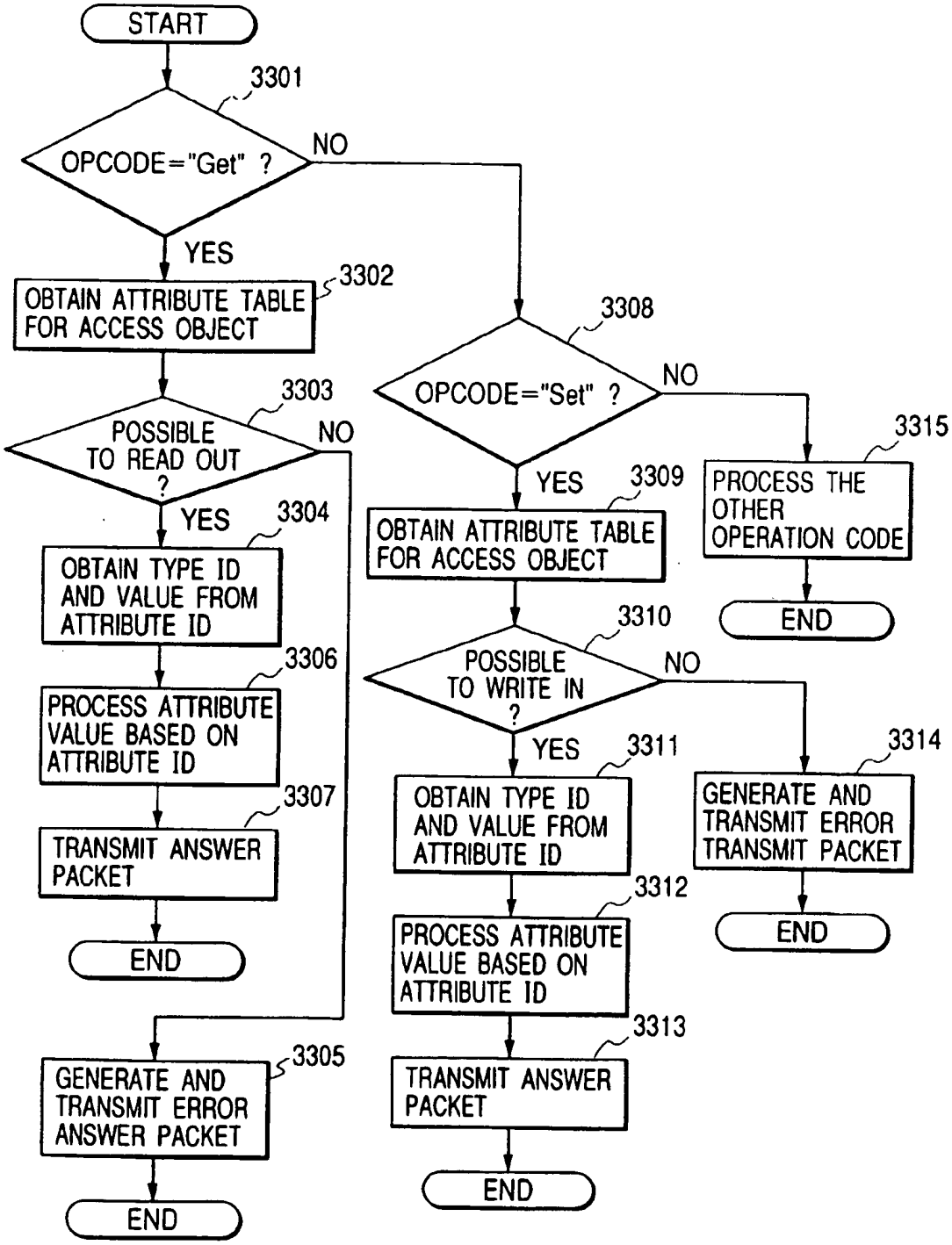


FIG. 49

PROCESS OF INQUIRY FOR SERVICE ID LIST

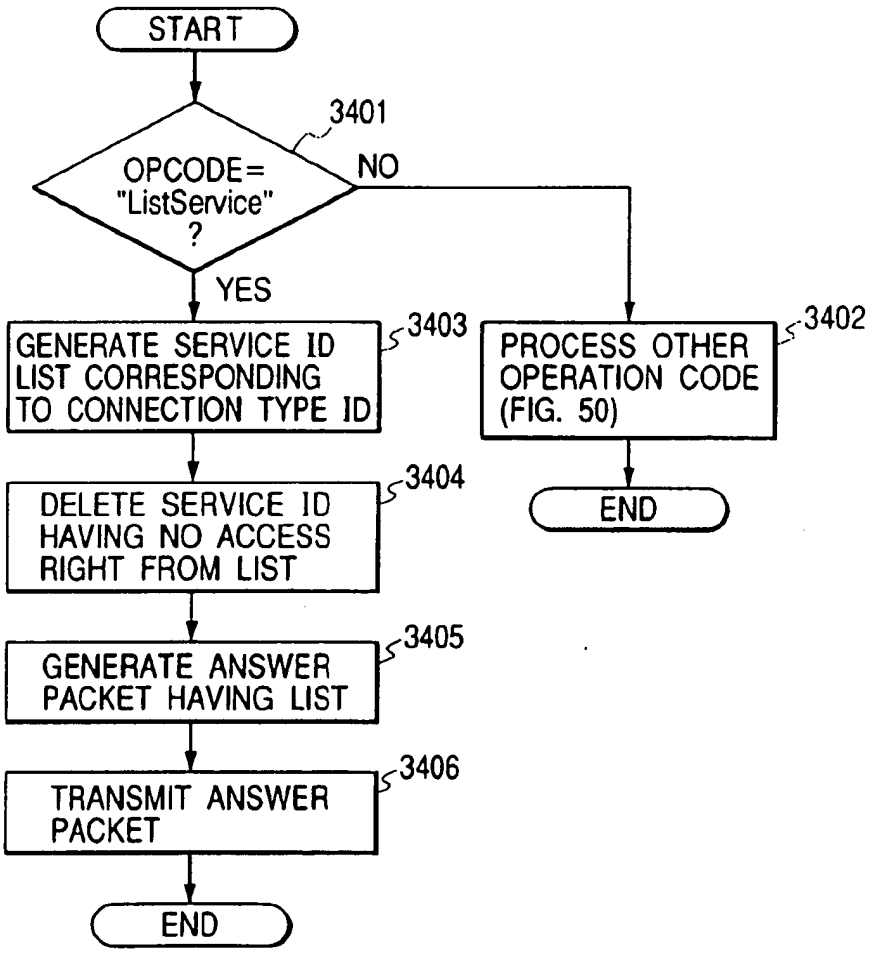


FIG. 50

PROCESS OF INQUIRY FOR SUB ADDRESS

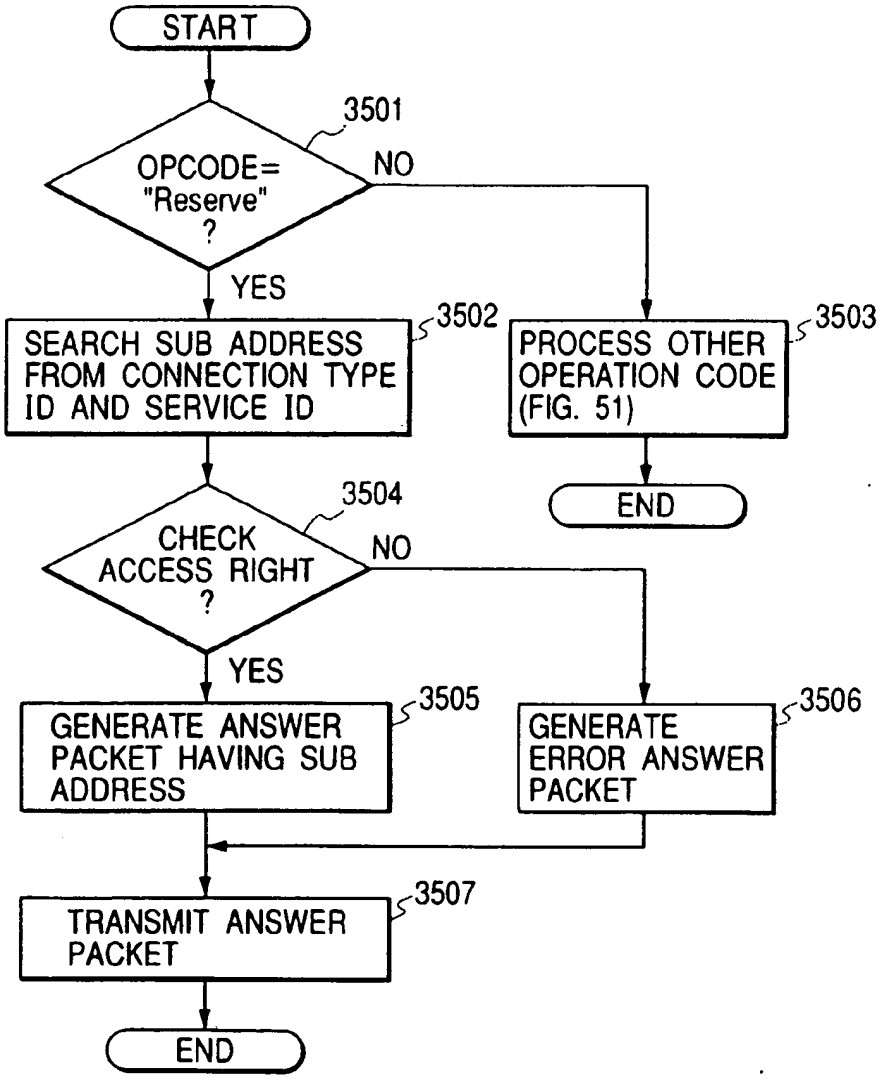


FIG. 51

PROCESS OF INQUIRY FOR SERVICE ID DESIGNATING TASK TYPE

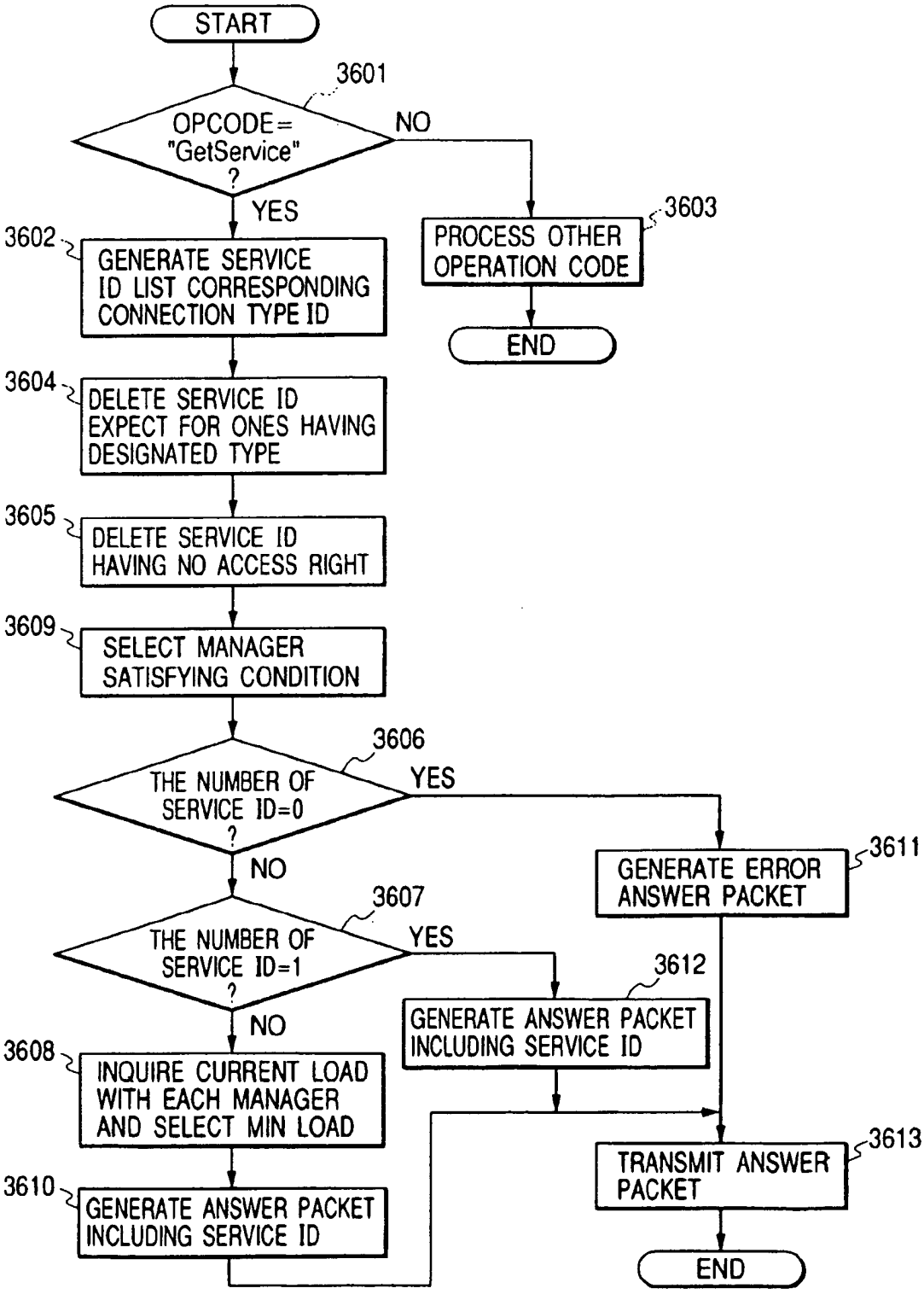


FIG. 52

CERTIFY SERVICE ID, USER ID AND PWD

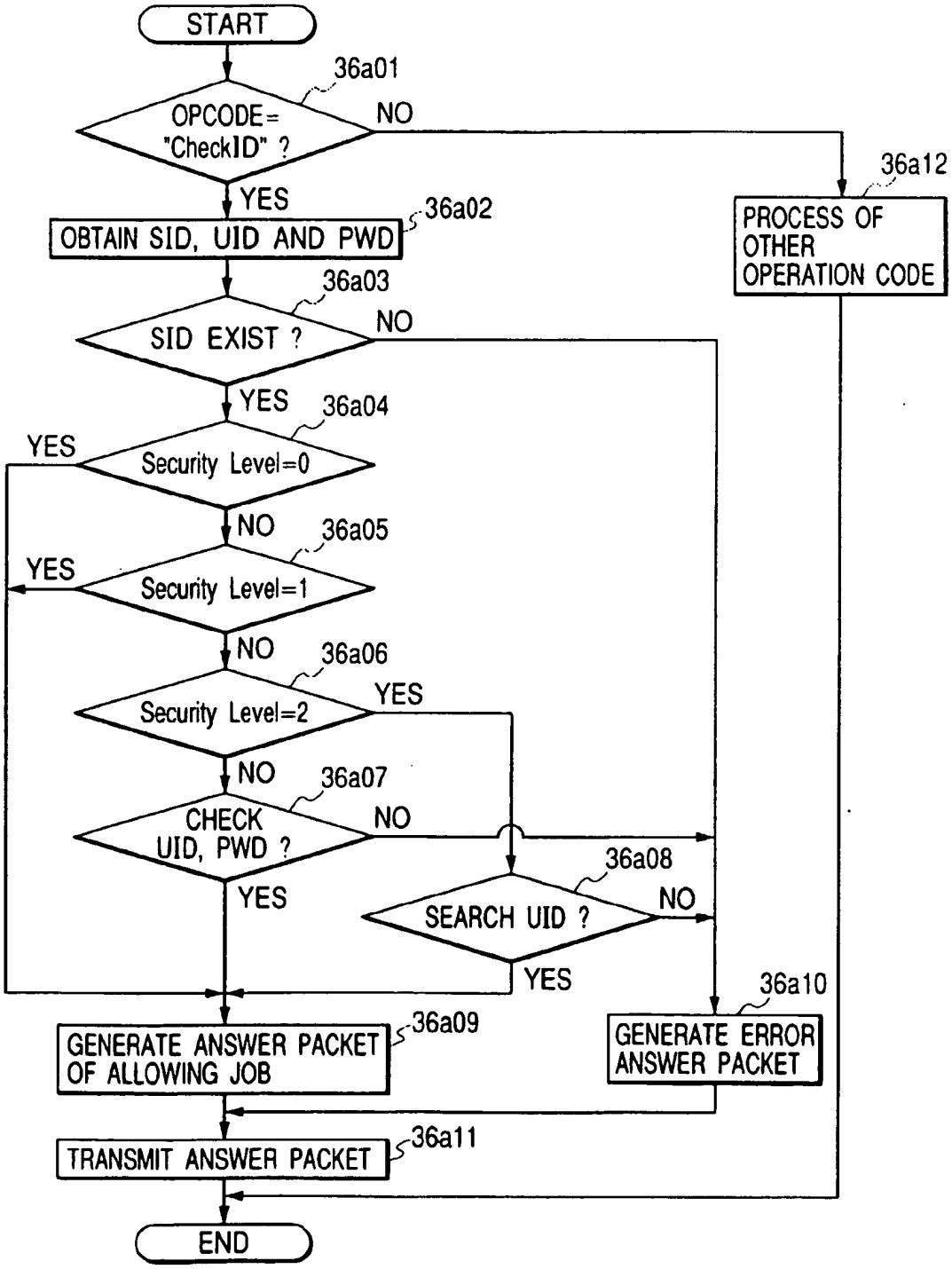


FIG. 53

JOB STRUCTURE (INCLUDING DOCUMENT AND BINDER)

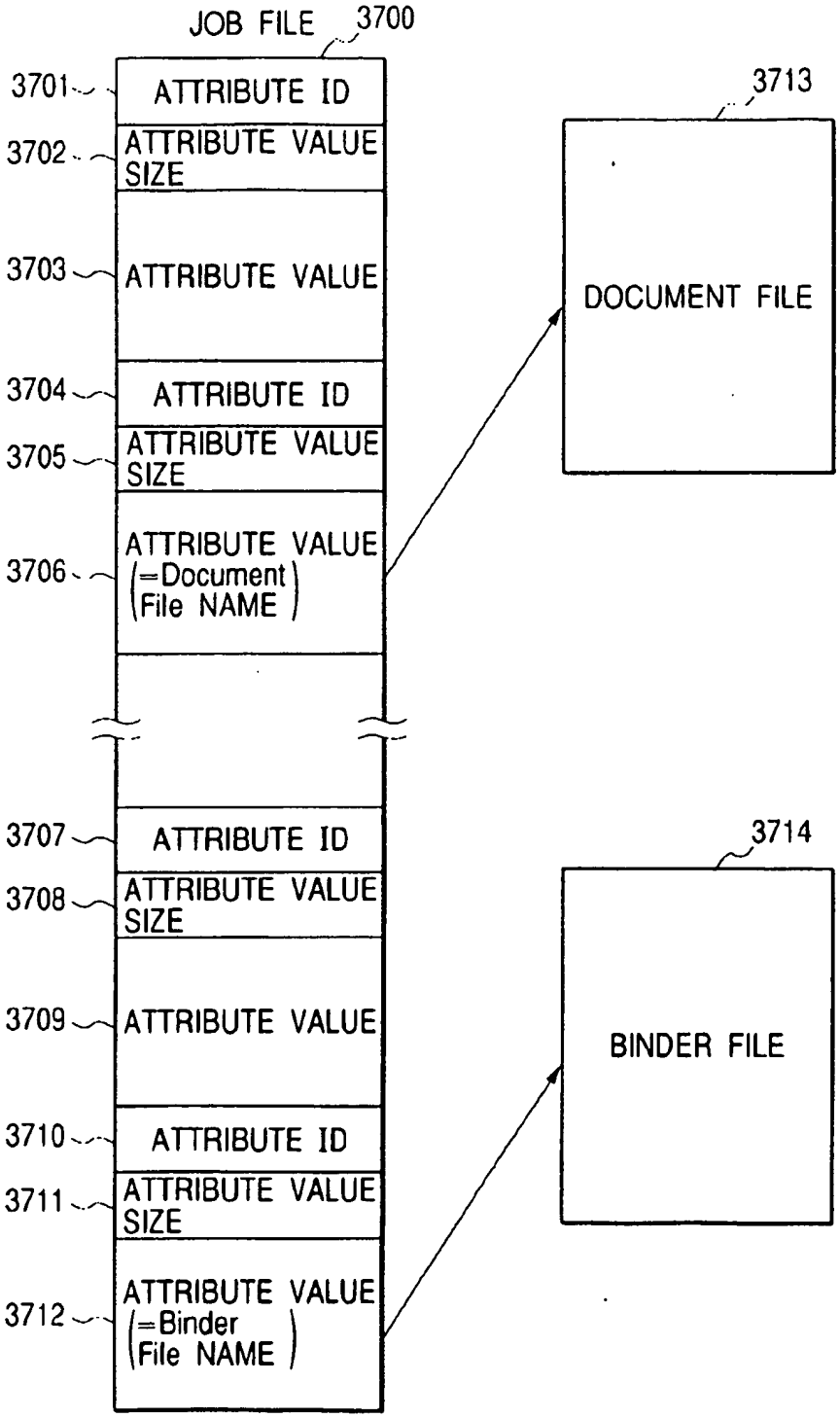


FIG. 54

DOCUMENT STRUCTURE (INCLUDING DATA)

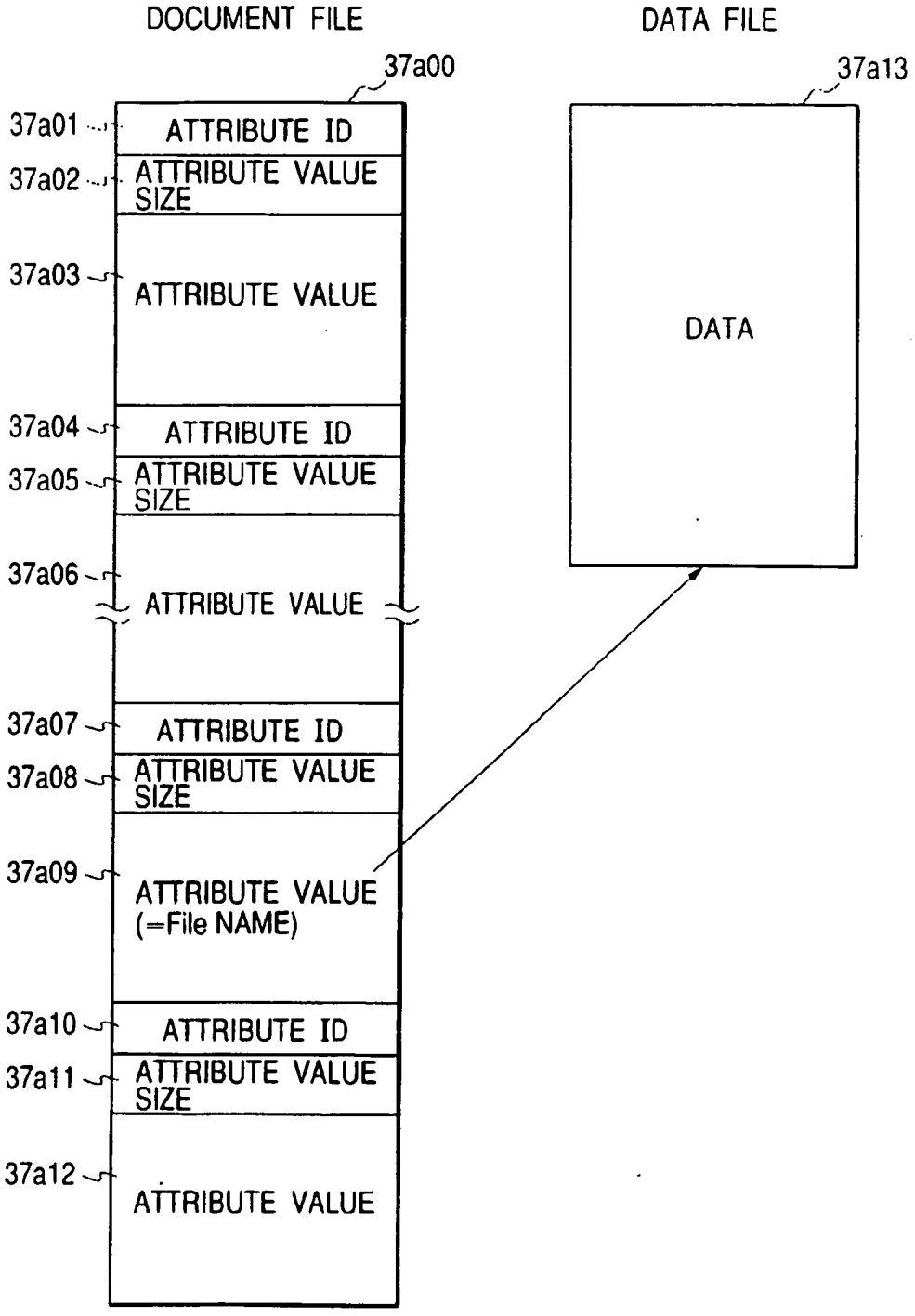


FIG. 55

BINDER STRUCTURE (INCLUDING DOCUMENT)

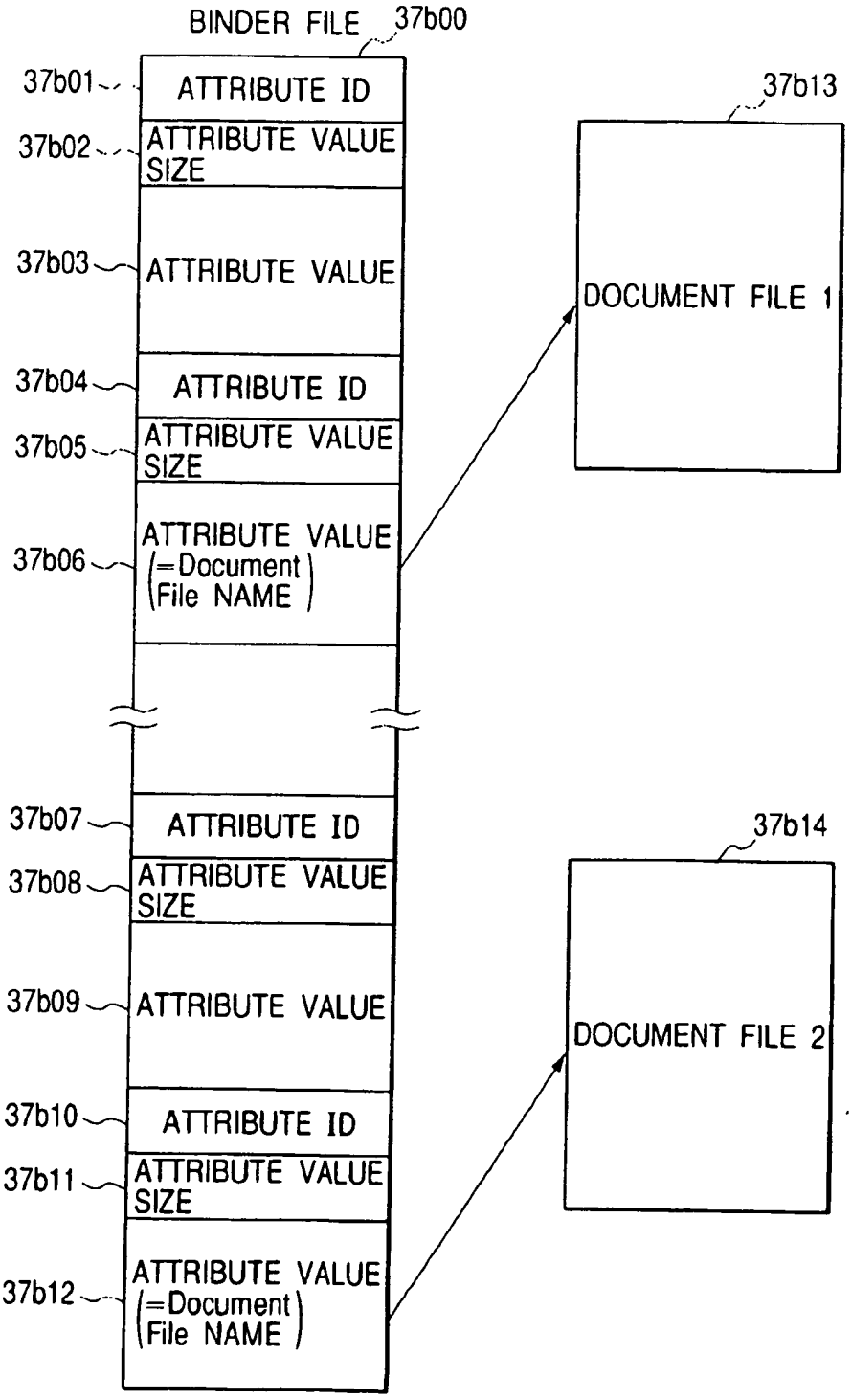


FIG. 56

JOB SCRIPT PROCESS OF EACH MANAGER

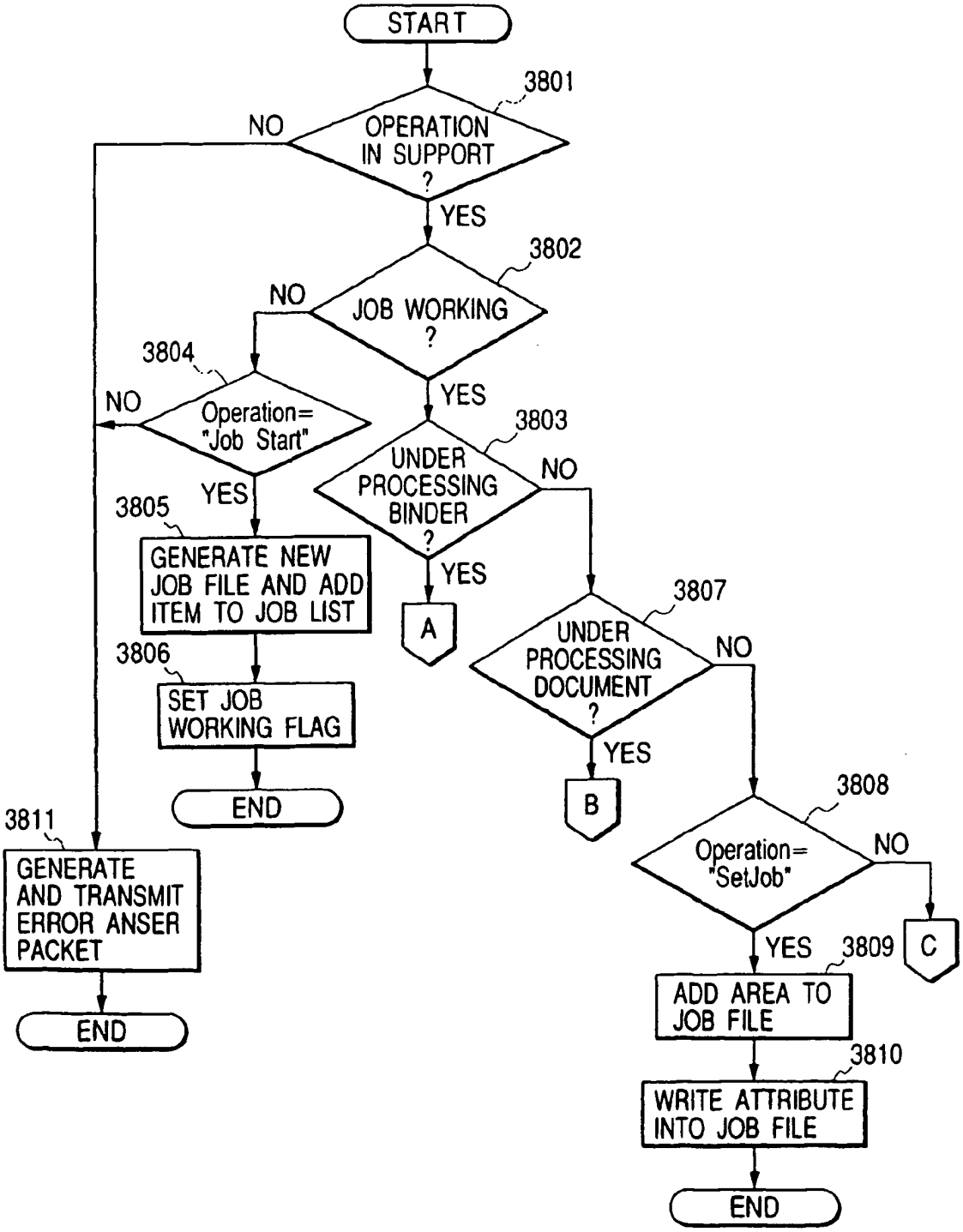


FIG. 57

JOB SCRIPT PROCESS OF EACH MANAGER (FROM FIG. 56)

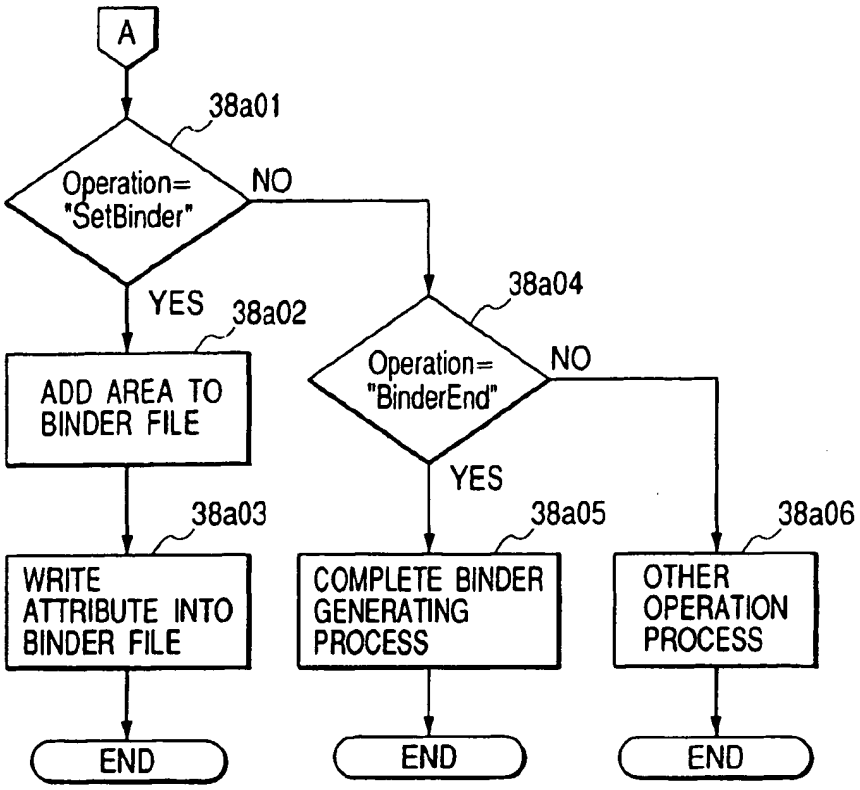


FIG. 58

JOB SCRIPT PROCESS OF EACH MANAGER (FROM FIG. 56)

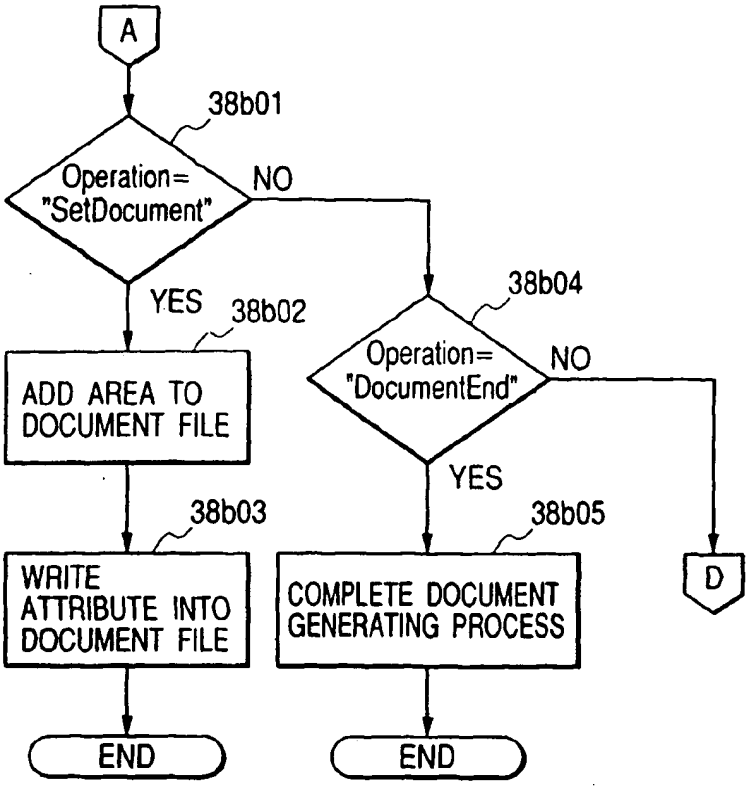


FIG. 59

JOB SCRIPT PROCESS OF EACH MANAGER (FROM FIG. 56)

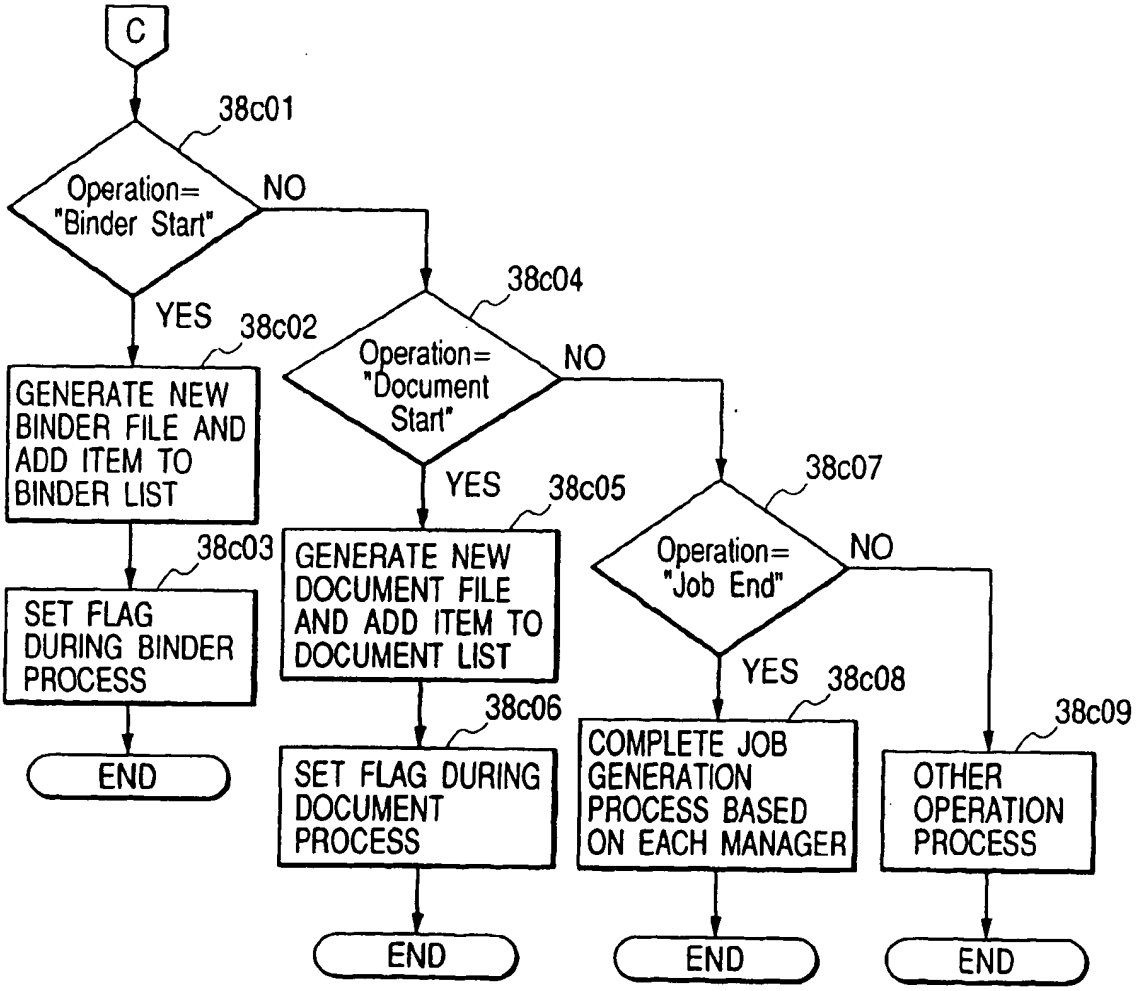


FIG. 60

JOB SCRIPT PROCESS OF EACH MANAGER (FROM FIG. 56)

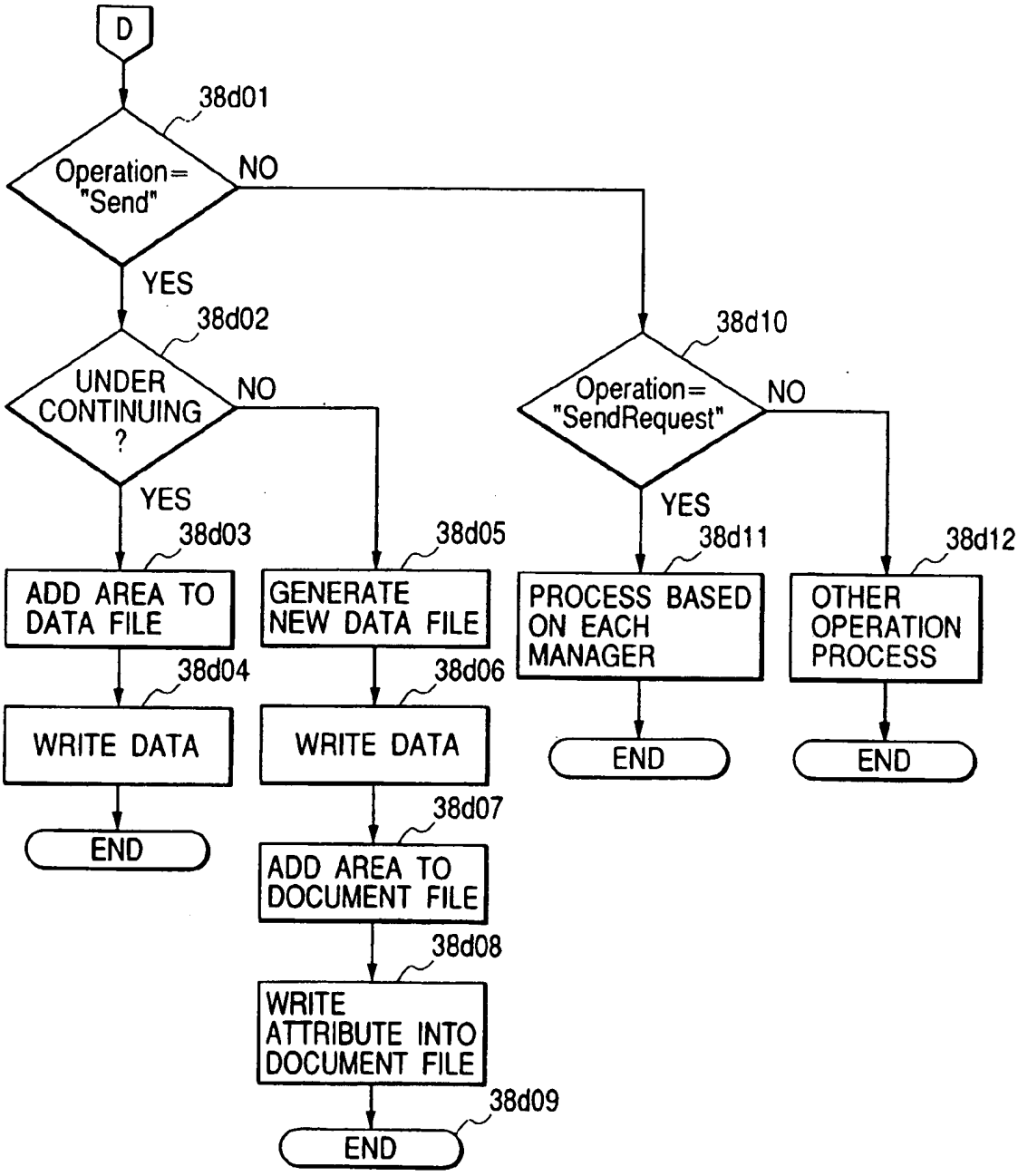


FIG. 61

JOB SCRIPT PROCESS OF EACH MANAGER (FROM FIG. 56)

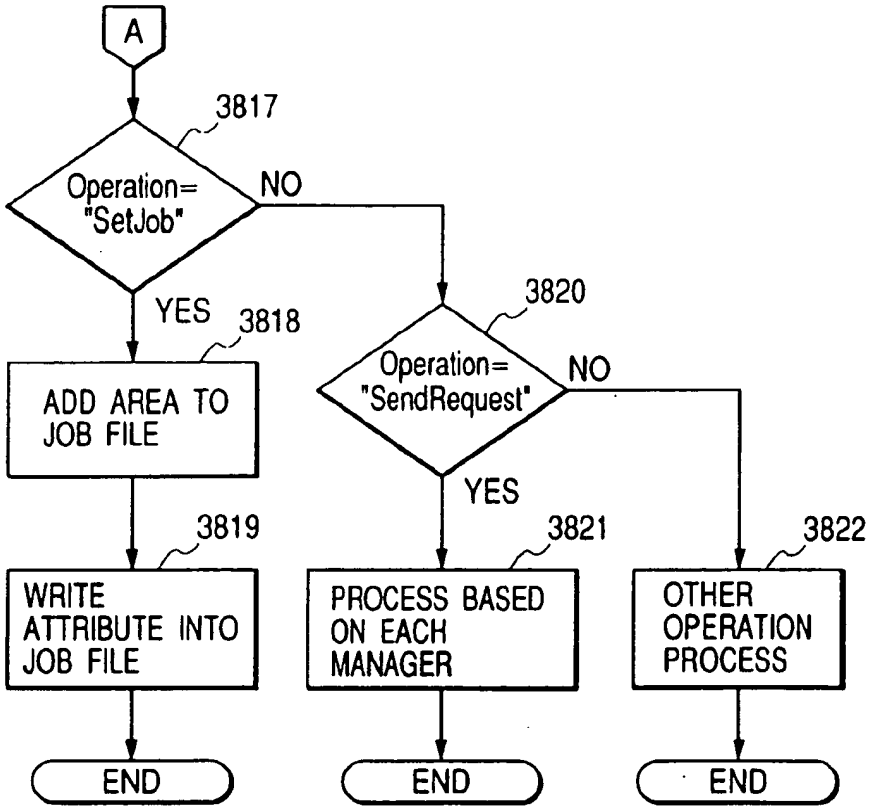


FIG. 62

DOCUMENT TABLE

Document ID	Document File Name
1	P0002
2	P1002
3	P2002

FIG. 63

BINDER TABLE

Binder ID	Binder File Name
1	P0003
2	P1003
3	P2003

FIG. 64

JOB PROCESS IN PRINT JOB MANAGER

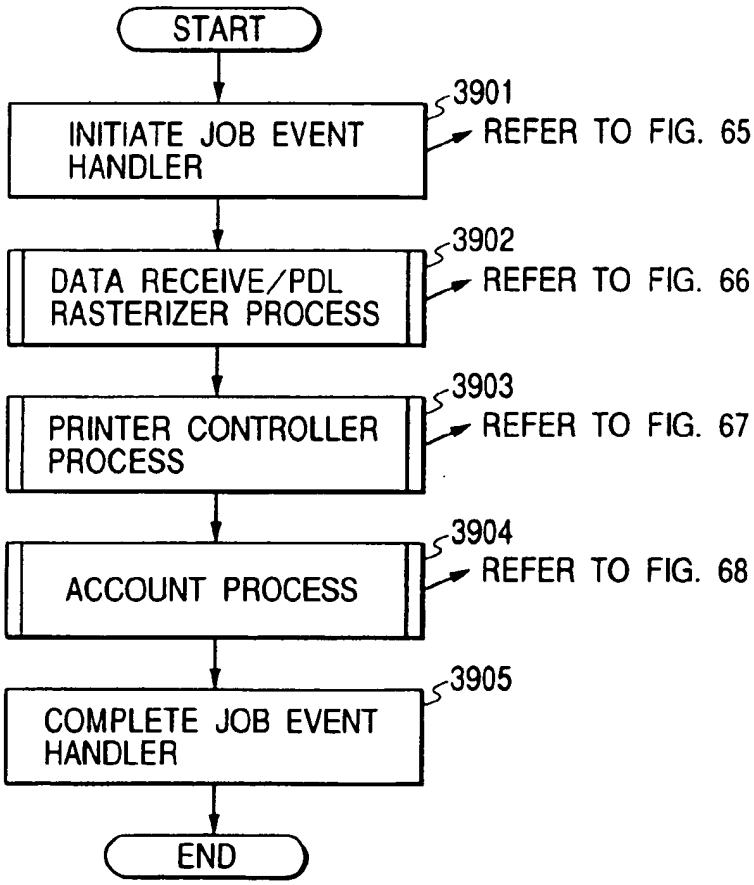


FIG. 65

JOB EVENT HANDLER PROCESS

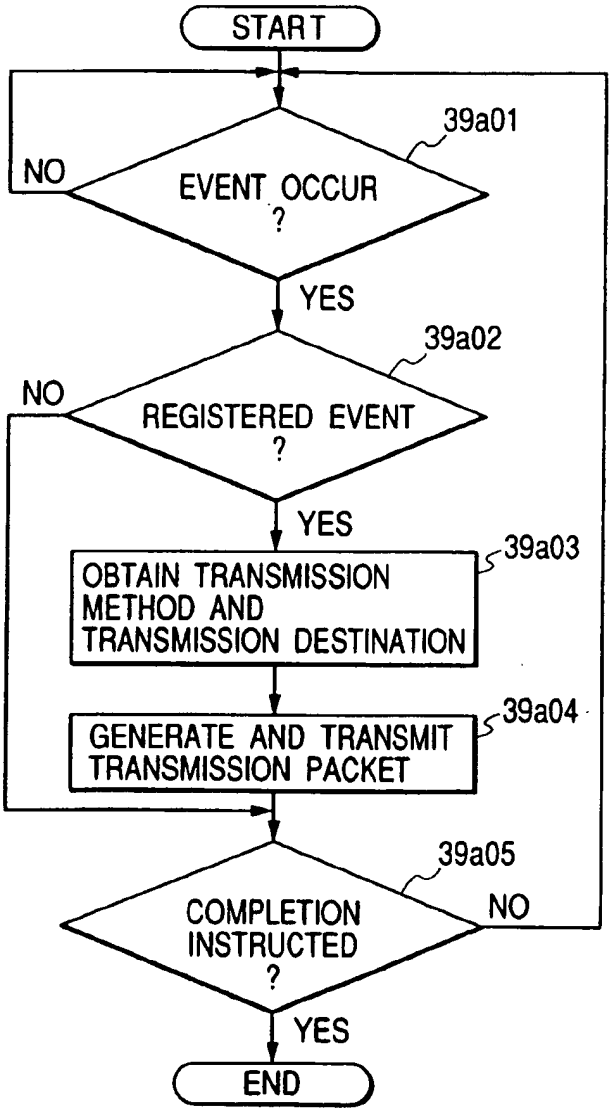


FIG. 66

DATA RECEIVE/PDL RASTERIZER PROCESS

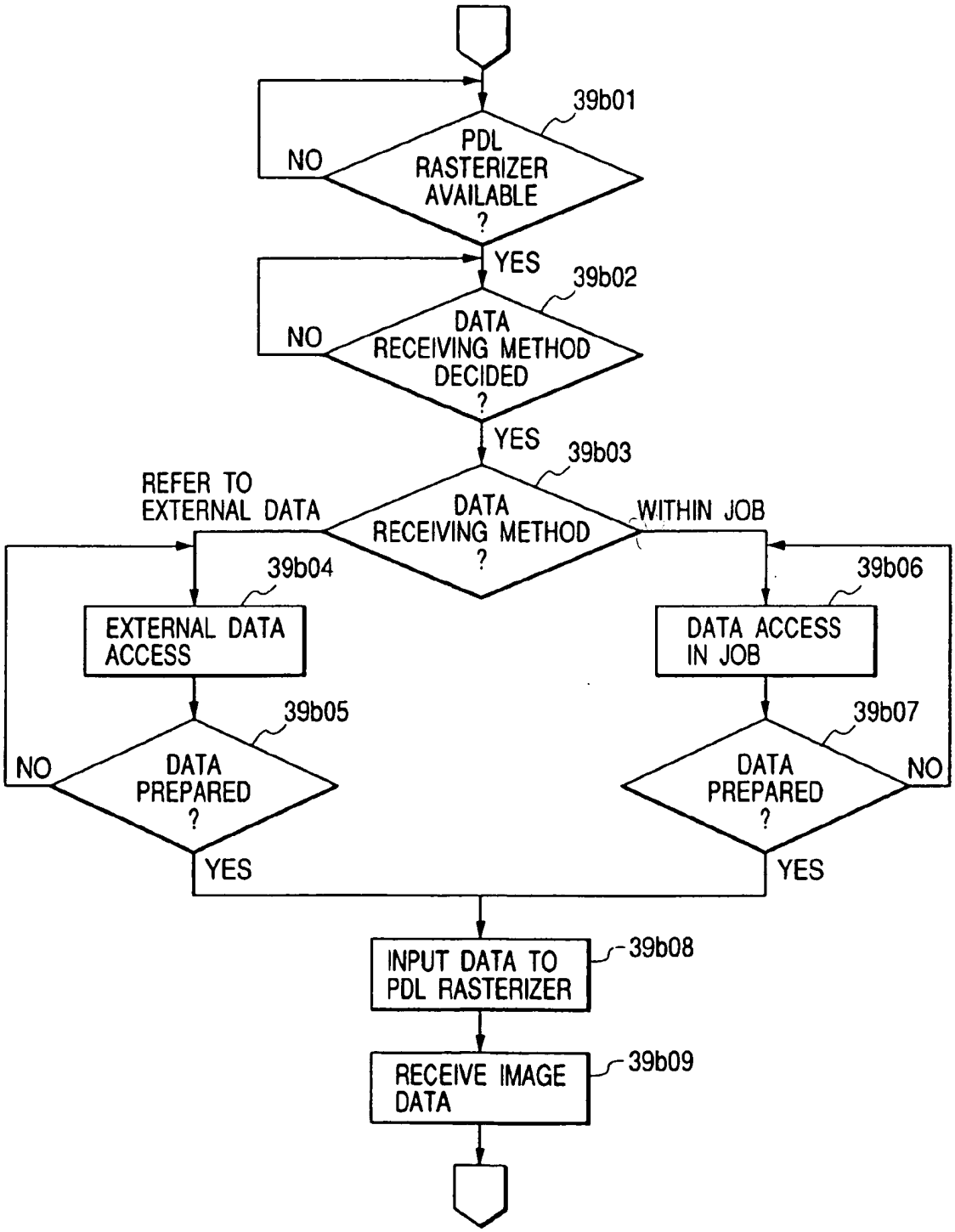


FIG. 67

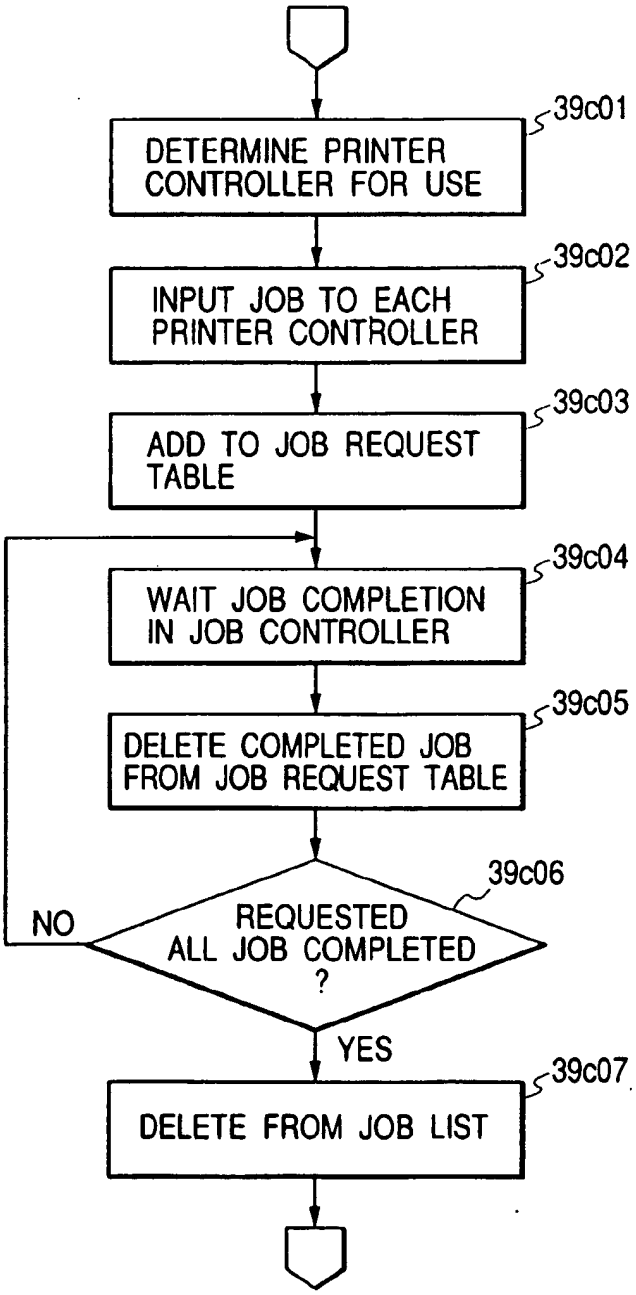

PRINTER CONTROLLER PROCESS
39c01
DETERMINE PRINTER CONTROLLER FOR USE
39c02
INPUT JOB TO EACH PRINTER CONTROLLER
39c03
ADD TO JOB REQUEST TABLE
39c04
WAIT JOB COMPLETION IN JOB CONTROLLER
39c05
DELETE COMPLETED JOB FROM JOB REQUEST TABLE
39c06
REQUESTED ALL JOB COMPLETED ?
NO
YES
39c07
DELETE FROM JOB LIST

FIG. 68

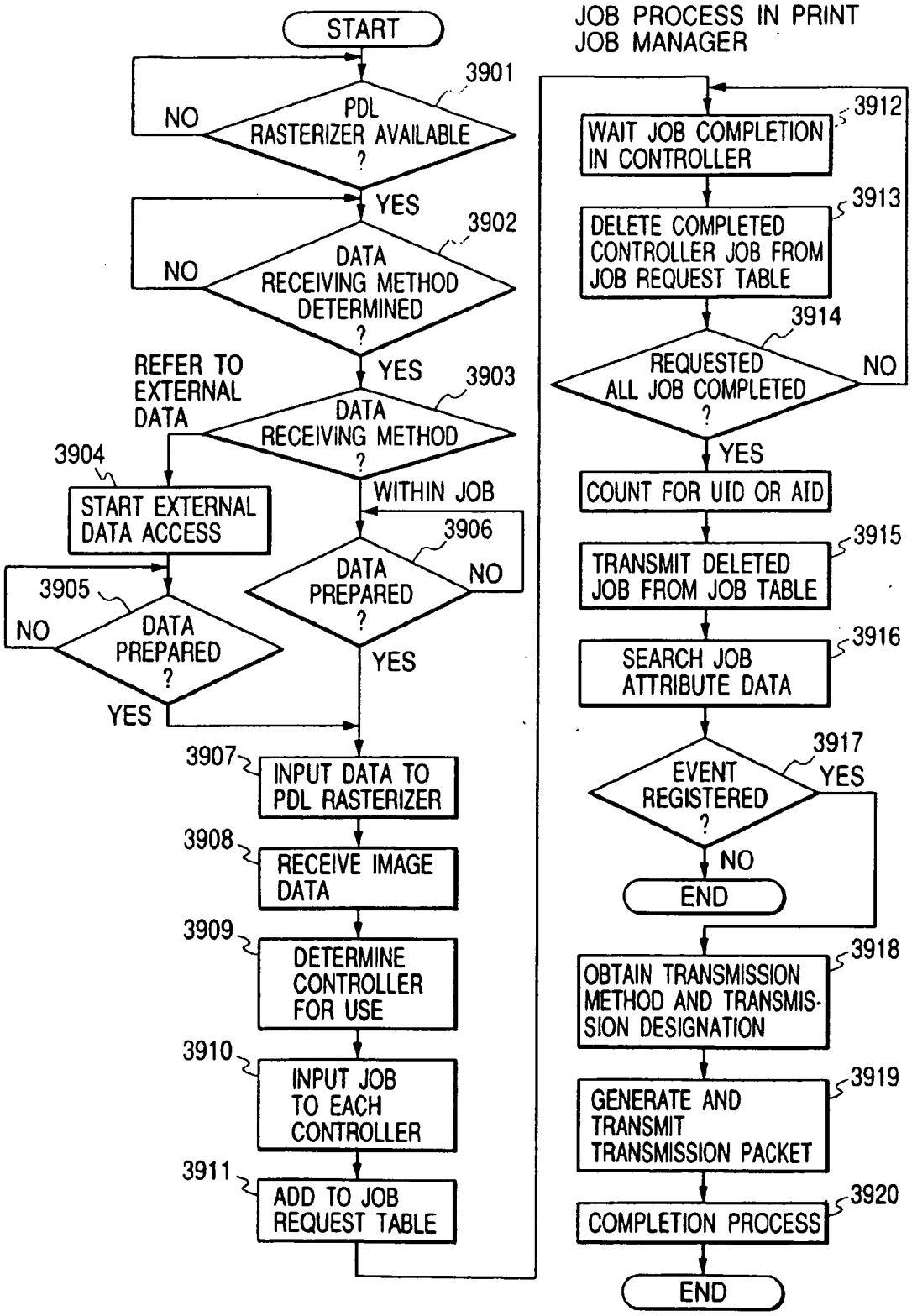

START
3901
PDL RASTERIZER AVAILABLE ?
NO
YES
3902
DATA RECEIVING METHOD DETERMINED ?
NO
YES
REFER TO EXTERNAL DATA
3903
DATA RECEIVING METHOD ?
WITHIN JOB
3904
START EXTERNAL DATA ACCESS
3905
DATA PREPARED ?
NO
YES
3906
DATA PREPARED ?
NO
YES
3907
INPUT DATA TO PDL RASTERIZER
3908
RECEIVE IMAGE DATA
3909
DETERMINE CONTROLLER FOR USE
3910
INPUT JOB TO EACH CONTROLLER
3911
ADD TO JOB REQUEST TABLE
JOB PROCESS IN PRINT JOB MANAGER
3912
WAIT JOB COMPLETION IN CONTROLLER
3913
DELETE COMPLETED CONTROLLER JOB FROM JOB REQUEST TABLE
3914
REQUESTED ALL JOB COMPLETED ?
NO
YES
COUNT FOR UID OR AID
3915
TRANSMIT DELETED JOB FROM JOB TABLE
3916
SEARCH JOB ATTRIBUTE DATA
3917
EVENT REGISTERED ?
YES
NO
END
3918
OBTAIN TRANSMISSION METHOD AND TRANSMISSION DESIGNATION
3919
GENERATE AND TRANSMIT TRANSMISSION PACKET
3920
COMPLETION PROCESS
END

FIG. 69

SCAN JOB PROCESS IN SCAN MANAGER

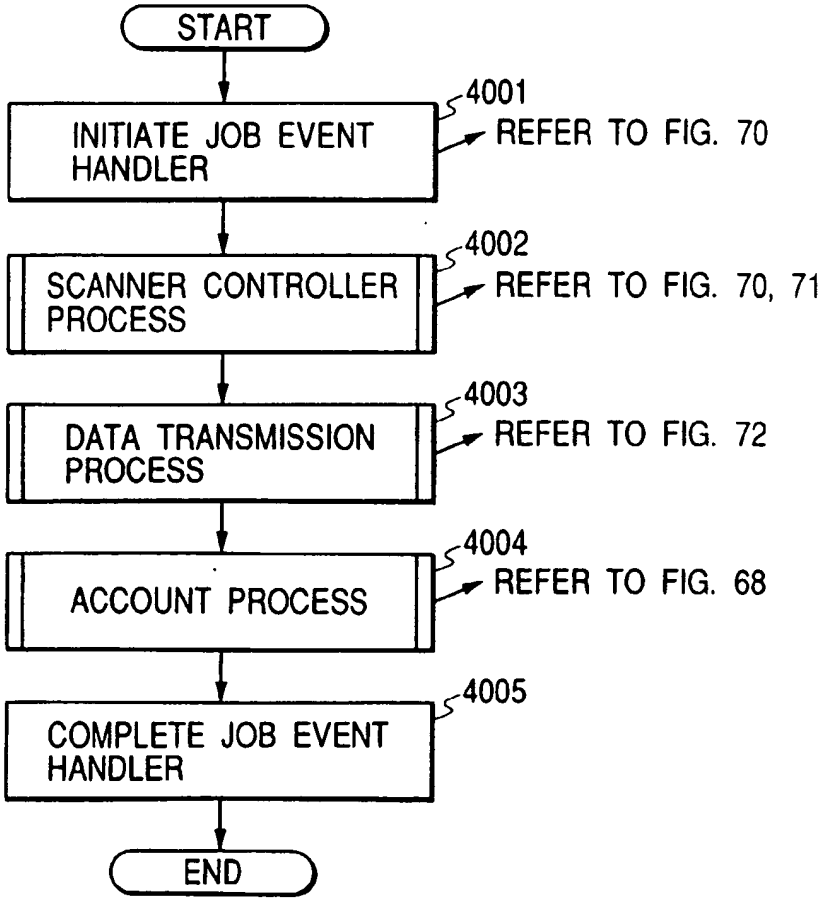


FIG. 70

SCANNER CONTROLLER PROCESS

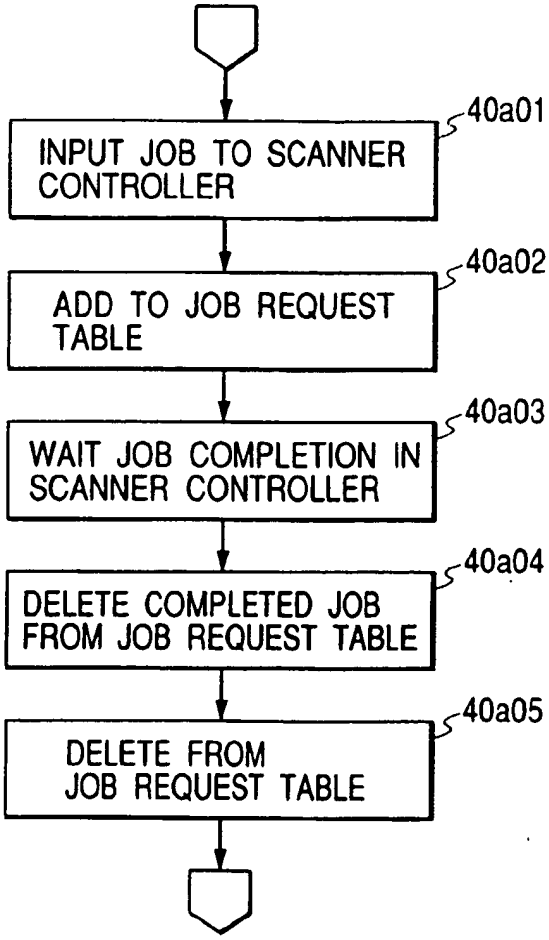


FIG. 71

SCANNER CONTROLLER INTERNAL PROCESS

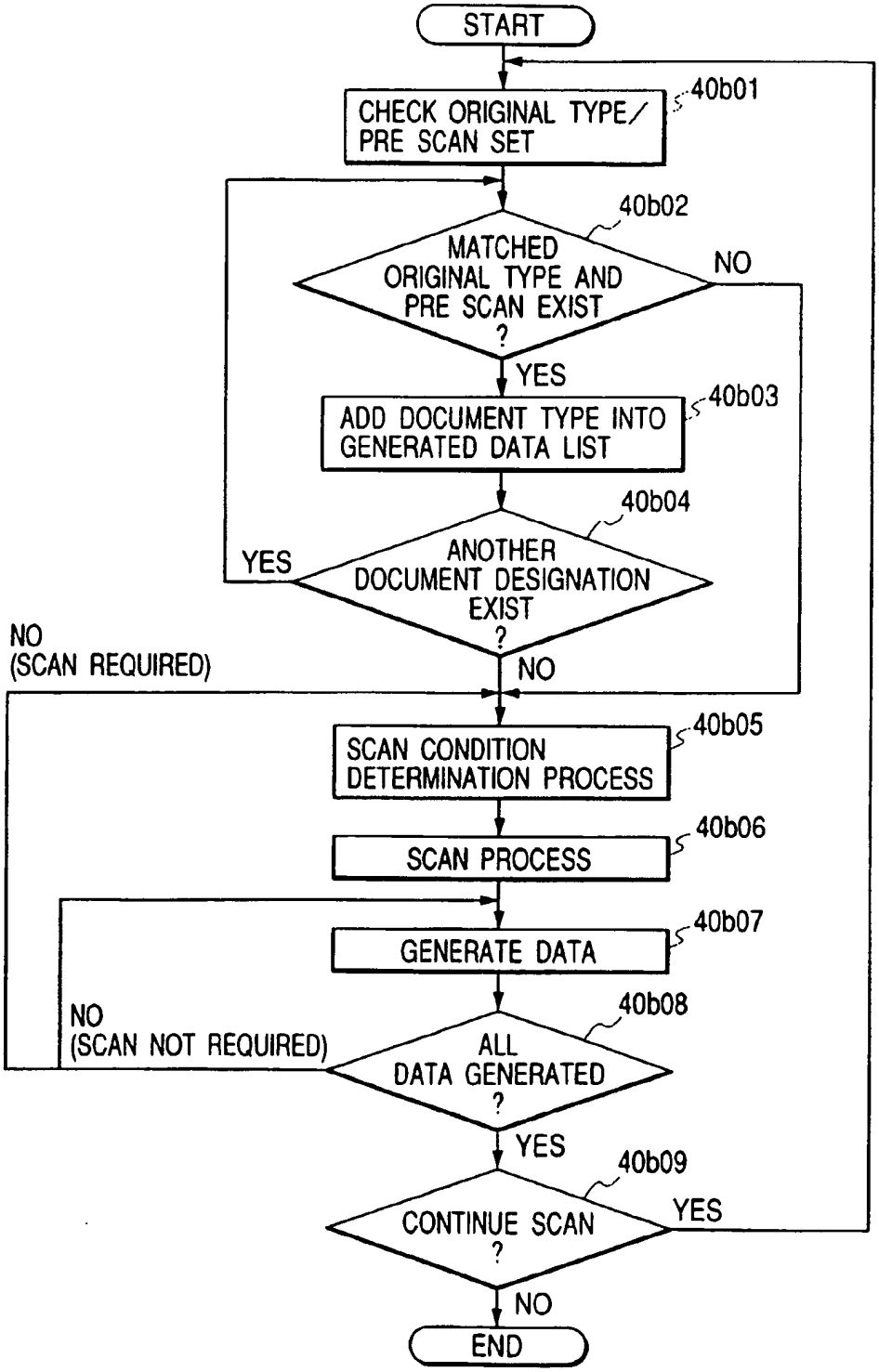


FIG. 72

DATA TRANSMISSION PROCESS

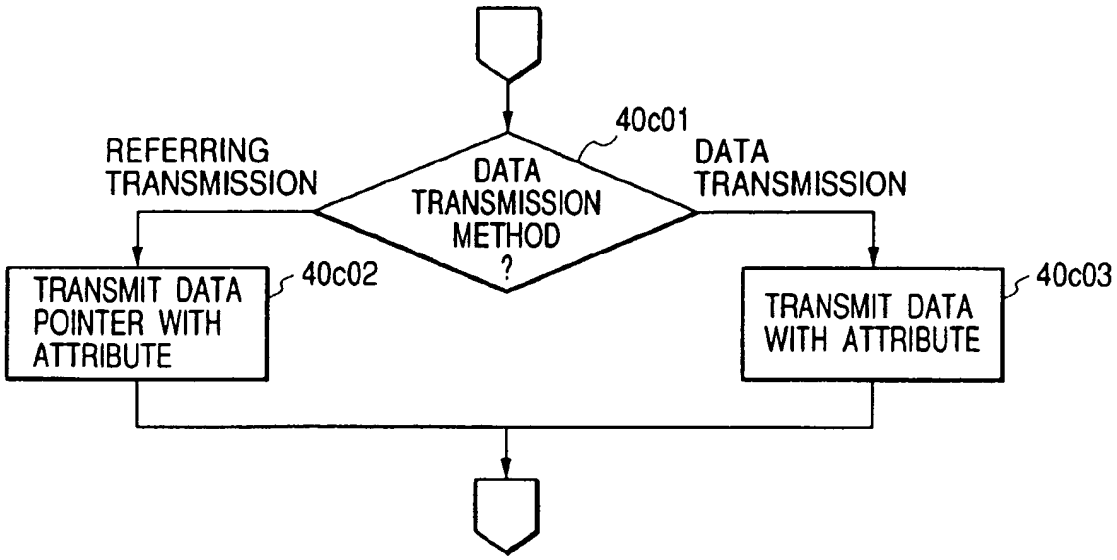


FIG. 73

SCAN JOB PROCESS IN COPY JOB MANAGER

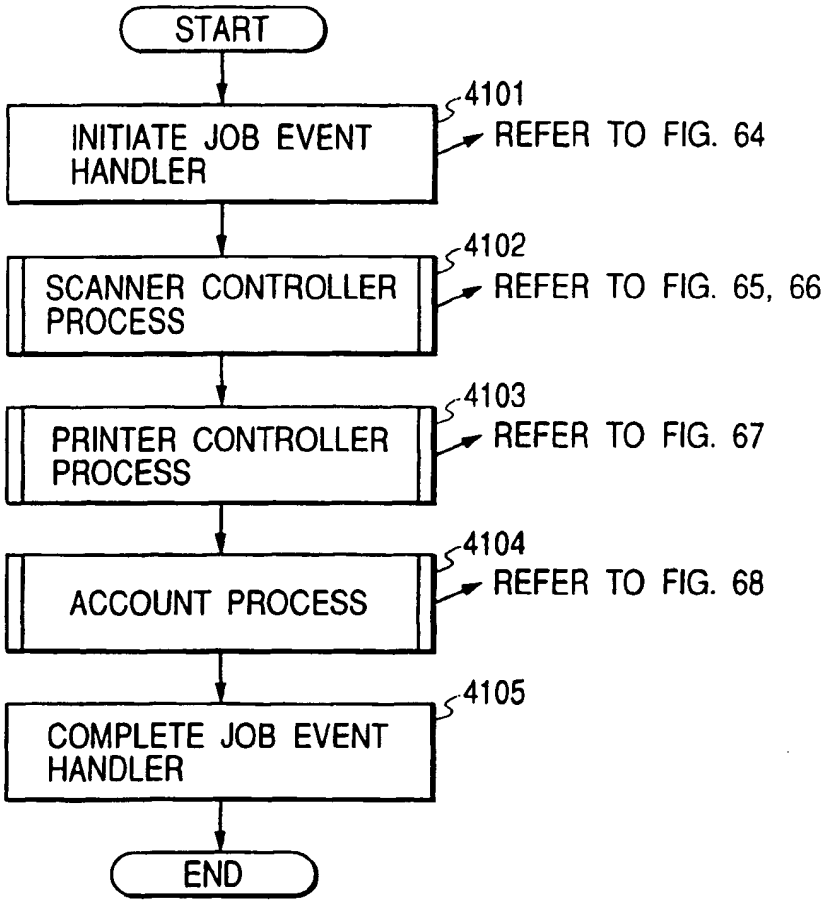


FIG. 74

JOB PROCESS (DOWN LOAD) IN FONT MANAGER, FORM OVERLAY MANAGER, LOG MANAGER, COLOR PROFILE MANAGER

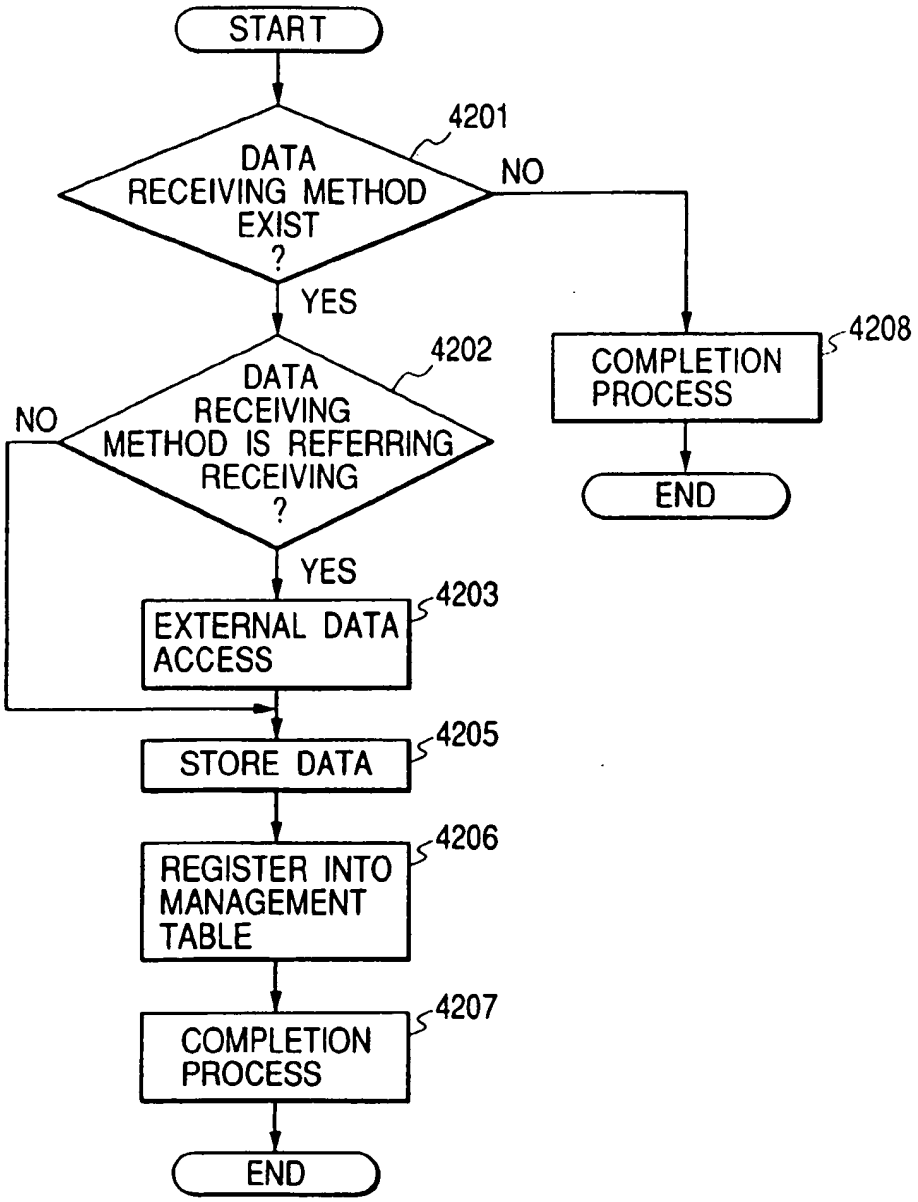


FIG. 75

JOB PROCESS (UP LOAD) IN FONT MANAGER, FORM OVERLAY MANAGER, LOG MANAGER, COLOR PROFILE MANAGER

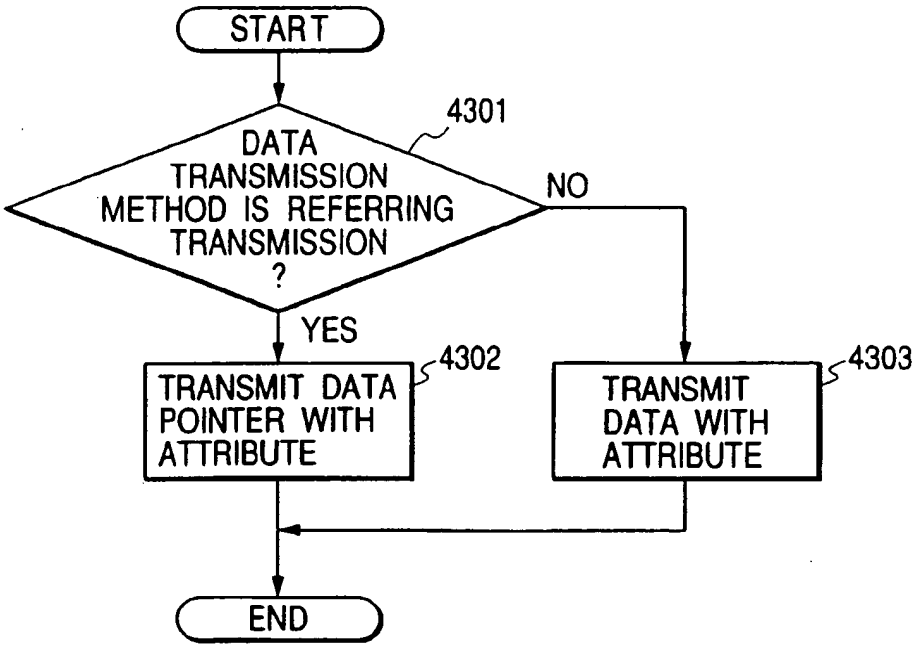


FIG. 76

JOB MANAGEMENT IN EACH MANAGER

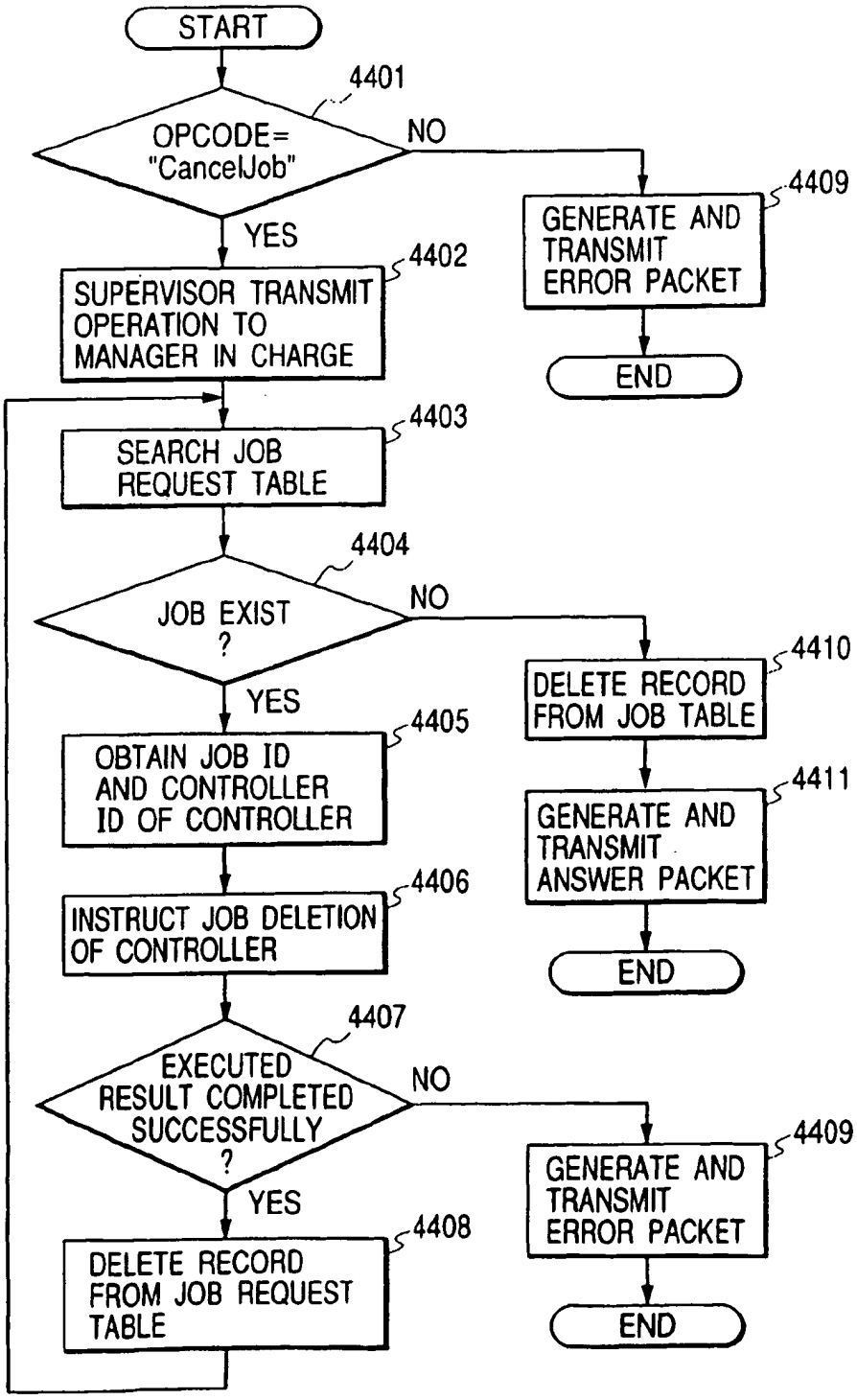


FIG. 77

EVENT TRANSMISSION

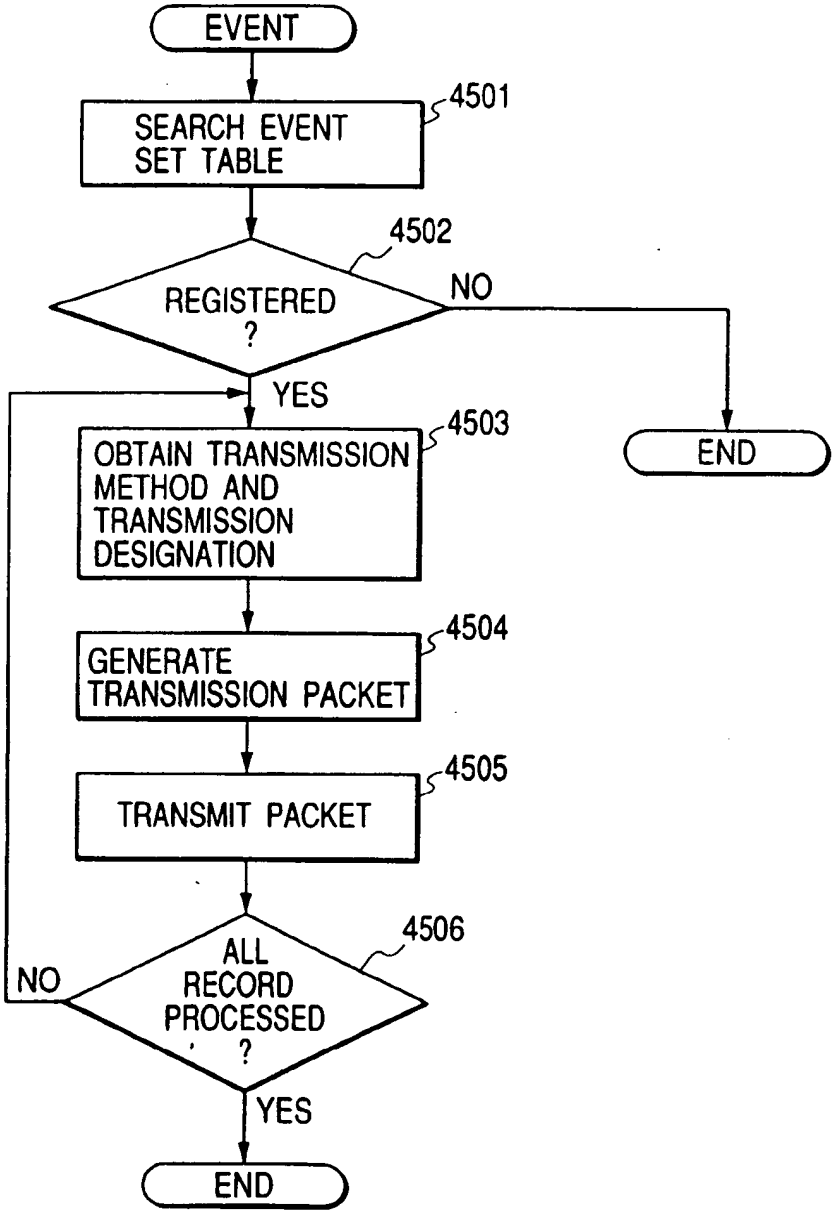


FIG. 78

DATA (SCRIPT) TRANSMISSION FROM DEVICE

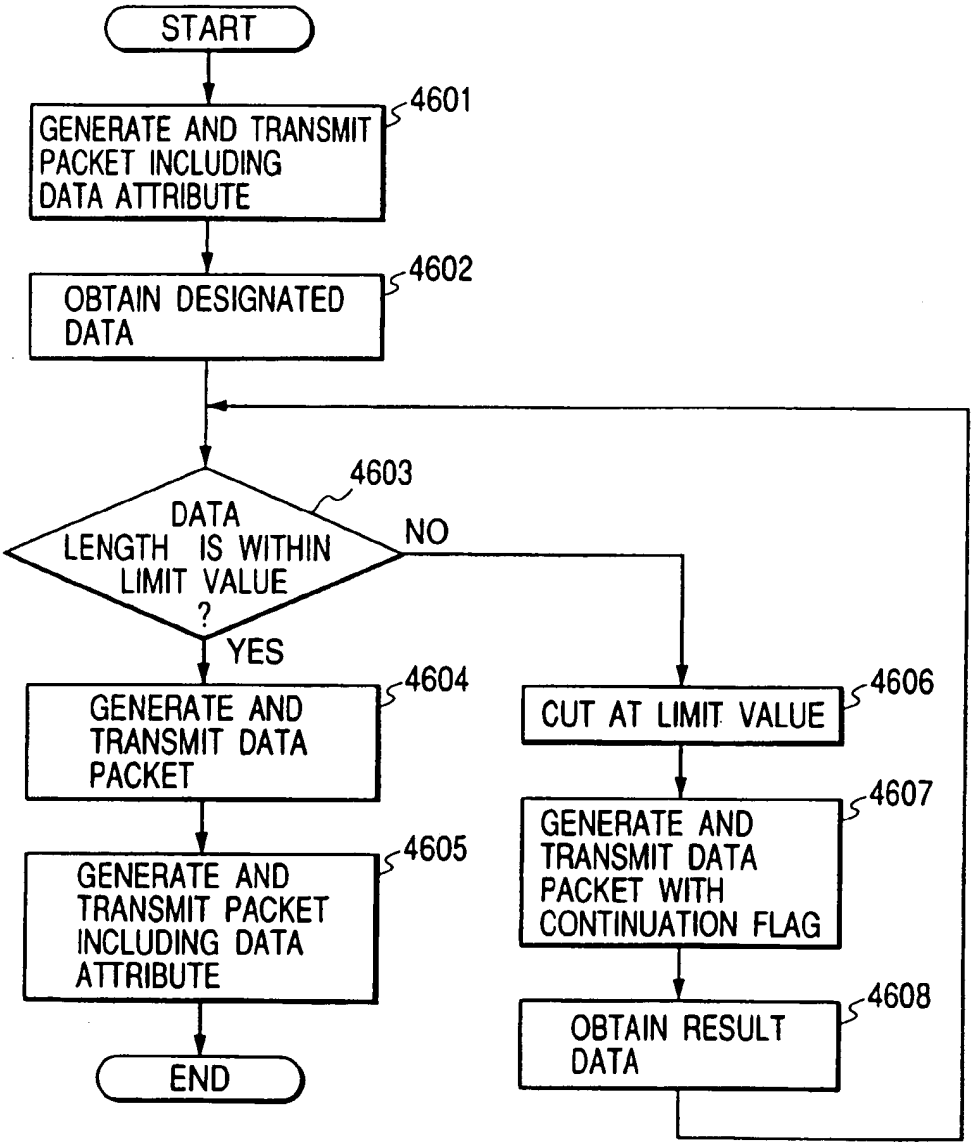


FIG. 79

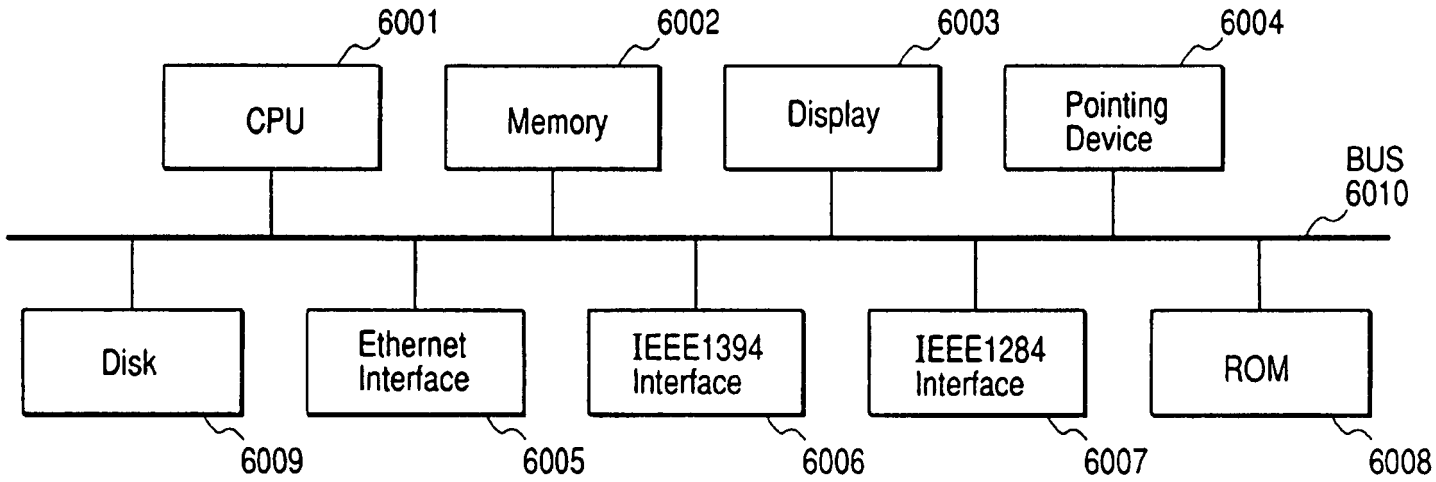

6001
6002
6003
6004
CPU
Memory
Display
Pointing Device
BUS
6010
Disk
Ethernet Interface
IEEE1394 Interface
IEEE1284 Interface
ROM
6009
6005
6006
6007
6008

FIG. 80

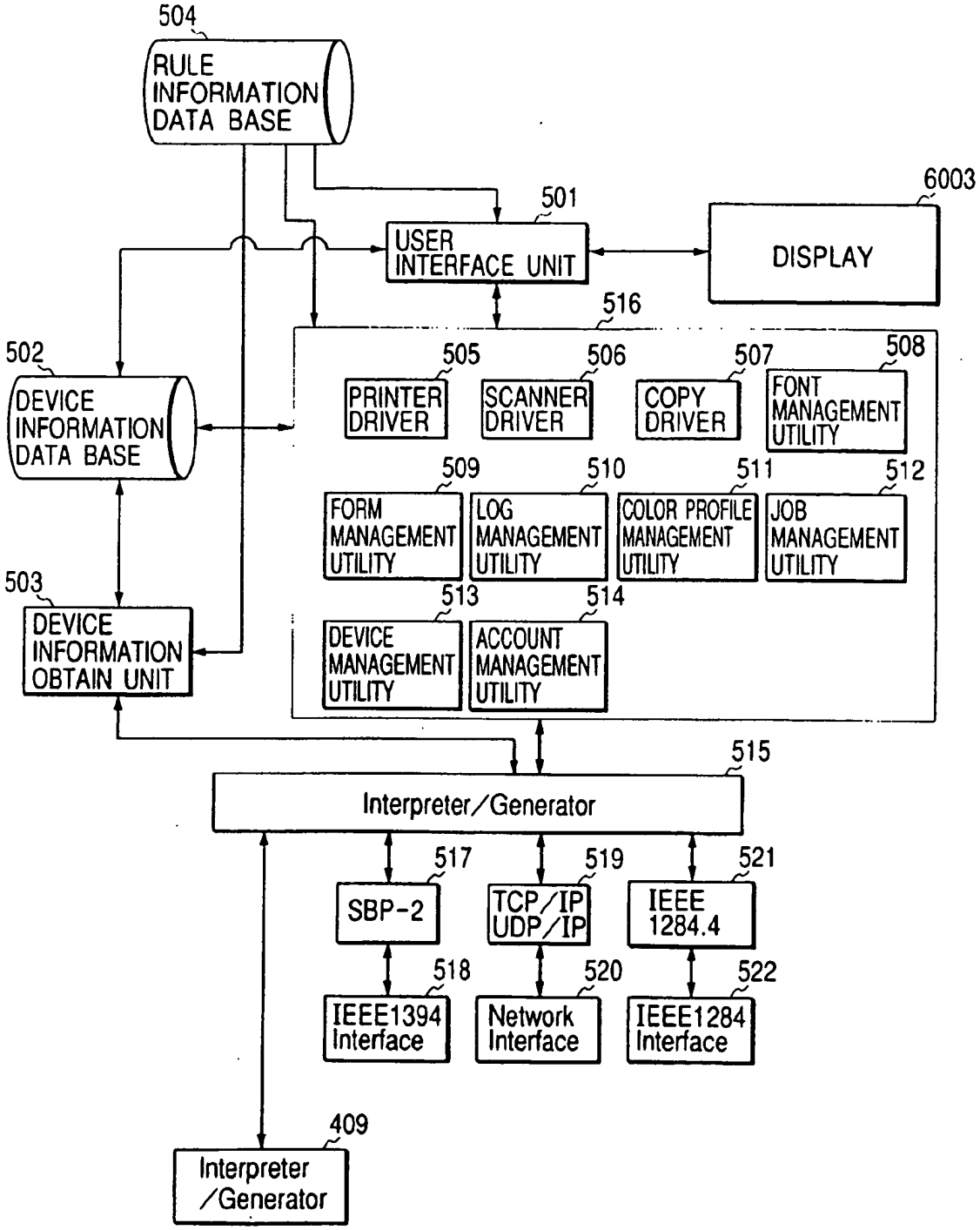
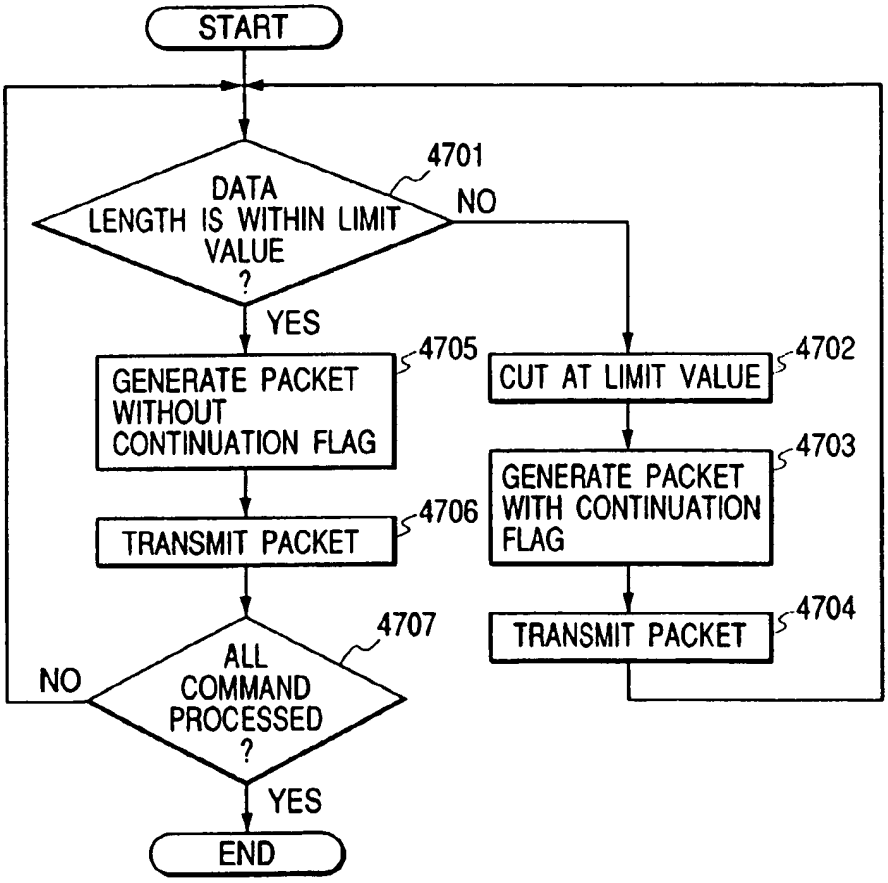

504
RULE INFORMATION DATA BASE
501
USER INTERFACE UNIT
6003
DISPLAY
516
502
DEVICE INFORMATION DATA BASE
505
PRINTER DRIVER
506
SCANNER DRIVER
507
COPY DRIVER
508
FONT MANAGEMENT UTILITY
509
FORM MANAGEMENT UTILITY
510
LOG MANAGEMENT UTILITY
511
COLOR PROFILE MANAGEMENT UTILITY
512
JOB MANAGEMENT UTILITY
503
DEVICE INFORMATION OBTAIN UNIT
513
DEVICE MANAGEMENT UTILITY
514
ACCOUNT MANAGEMENT UTILITY
515
Interpreter/Generator
517
SBP-2
519
TCP/IP UDP/IP
521
IEEE 1284.4
518
IEEE1394 Interface
520
Network Interface
522
IEEE1284 Interface
409
Interpreter /Generator

FIG. 81

PACKET GENERATING AND TRANSMISSION PROCESS



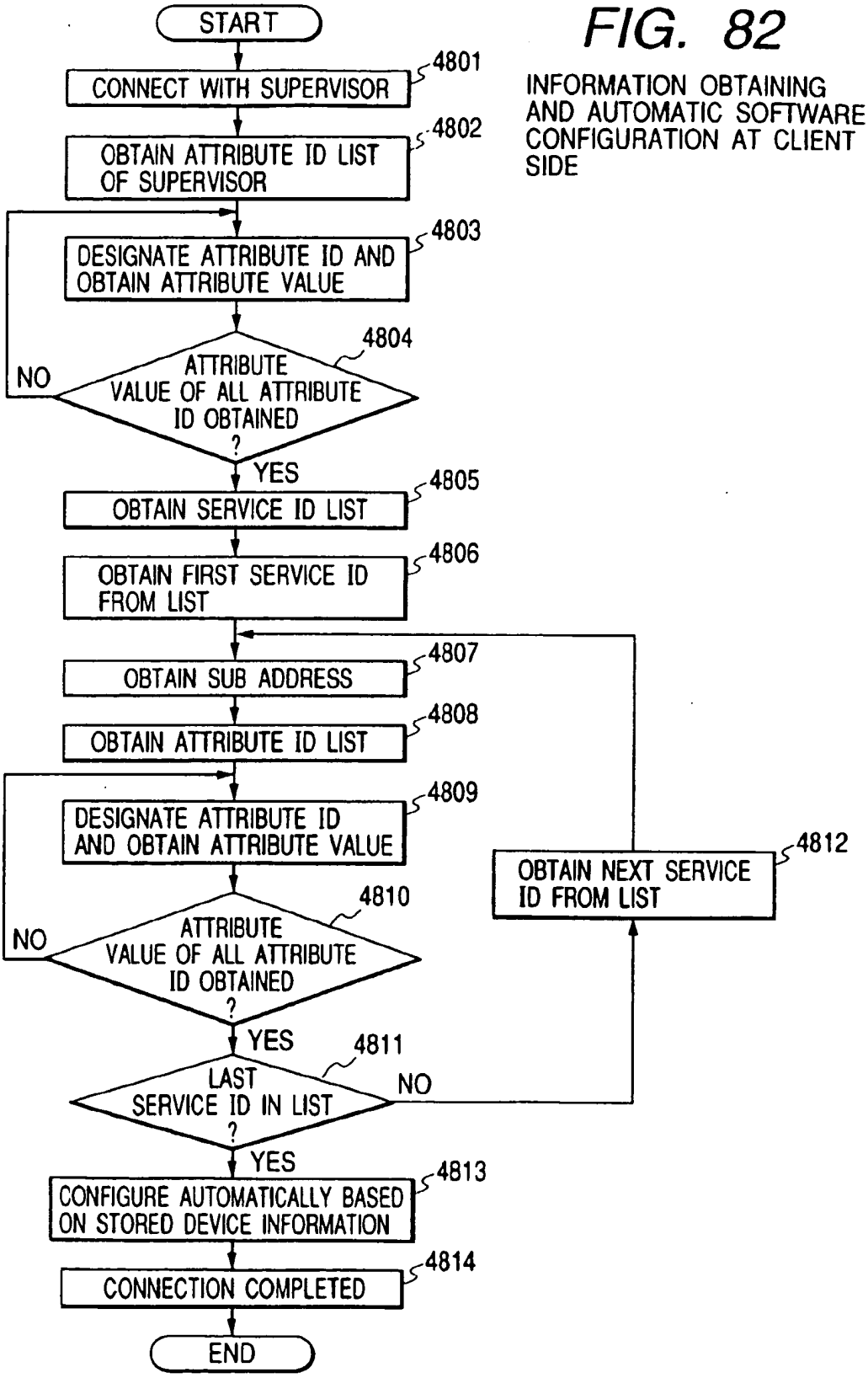


FIG. 82

INFORMATION OBTAINING AND AUTOMATIC SOFTWARE CONFIGURATION AT CLIENT SIDE

FIG. 83

ISSUE JOB DESIGNATING TASK TYPE

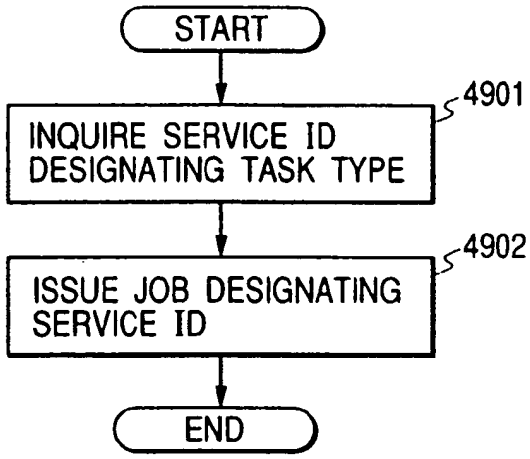


FIG. 84

EVENT STRUCTURE

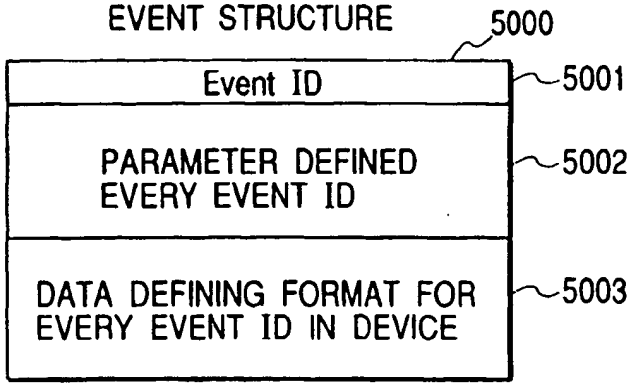


FIG. 85

EVENT PROCESS

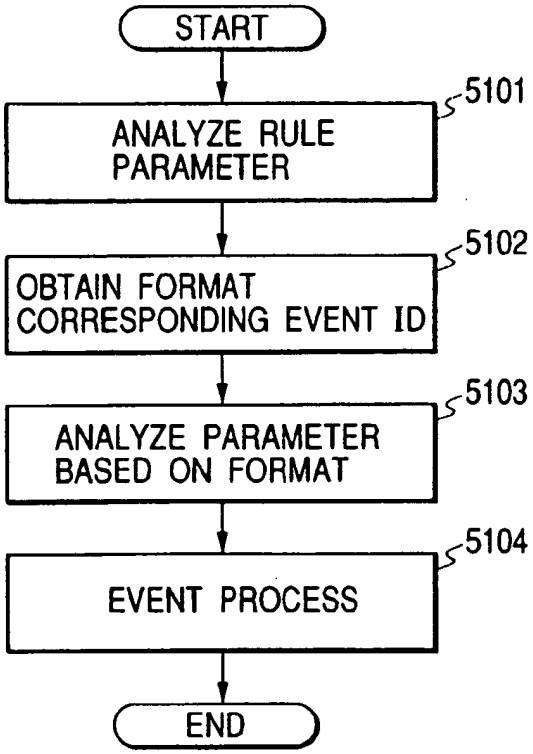


FIG. 86

LOG PROCESS

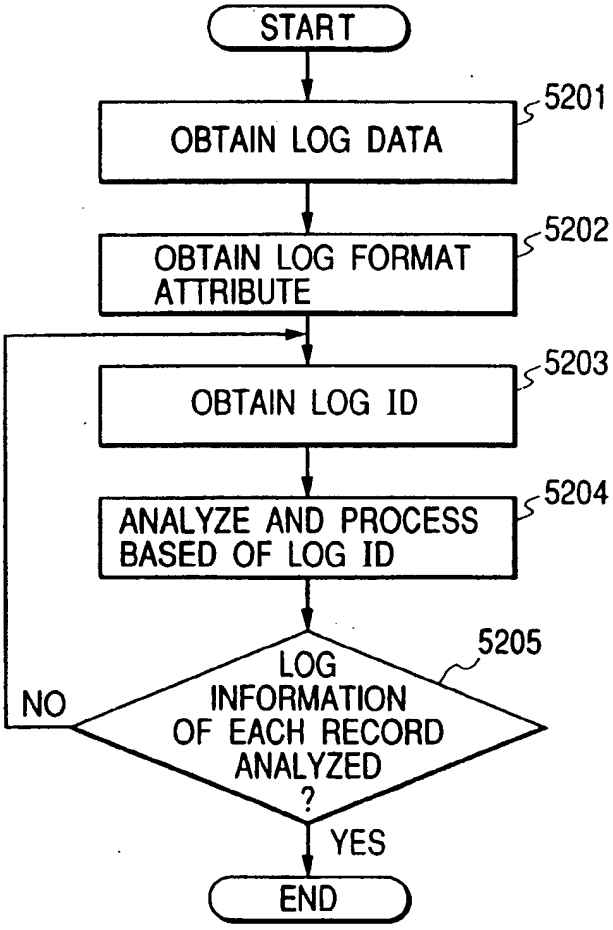


FIG. 87

OBTAIN AND PROCESS ACCOUNT INFORMATION

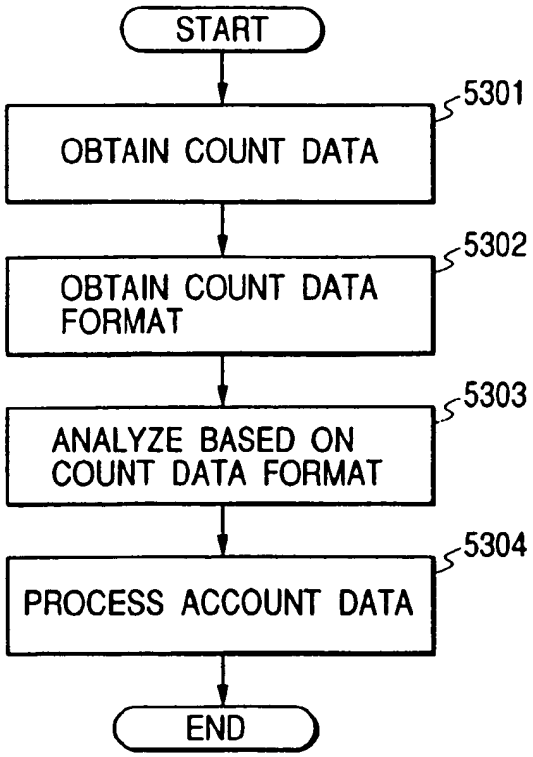


FIG. 88

ISSUE JOB
(PRINT JOB, DATA DOWN LOAD)

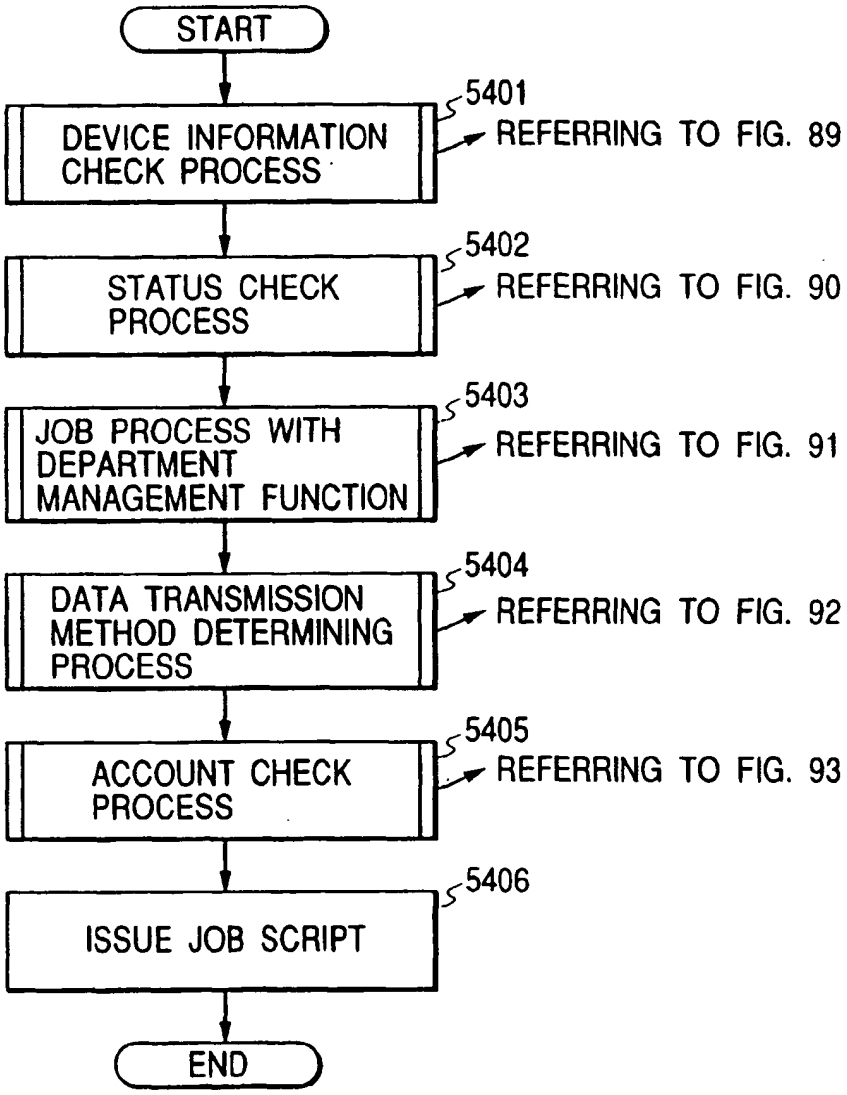


FIG. 89

DEVICE INFORMATION CHECK PROCESS

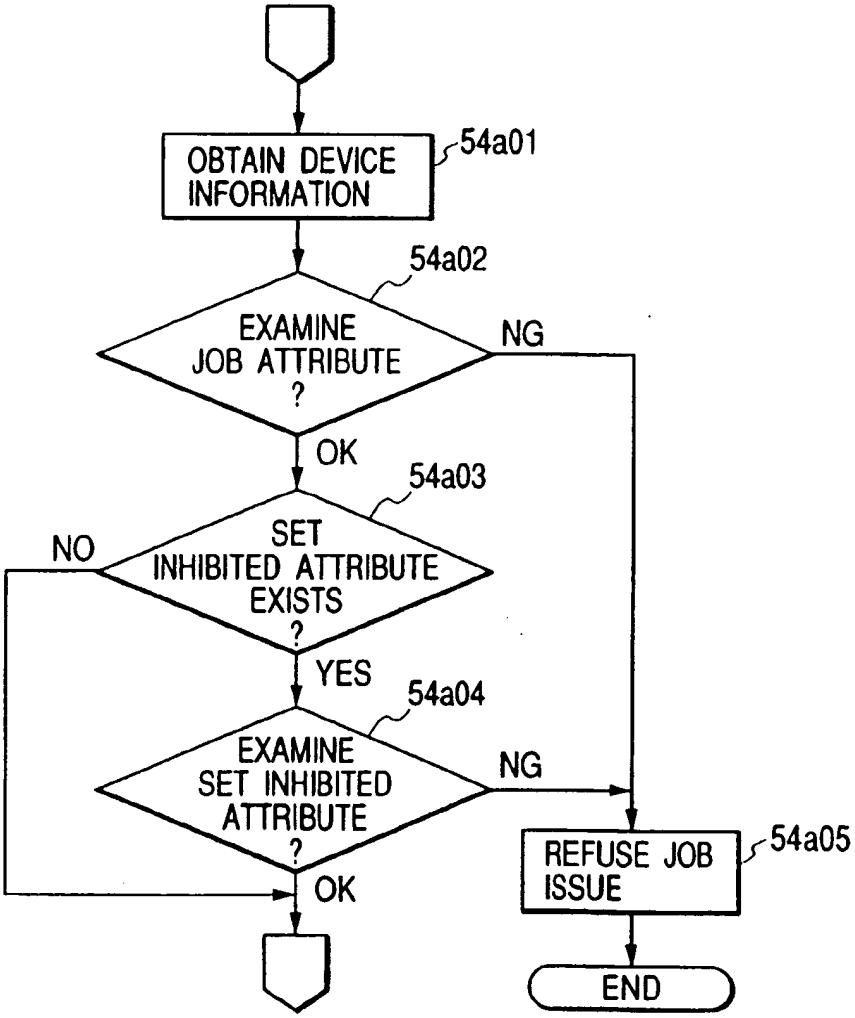


FIG. 90

STATUS CHECK PROCESS PRIOR TO JOB ISSUE

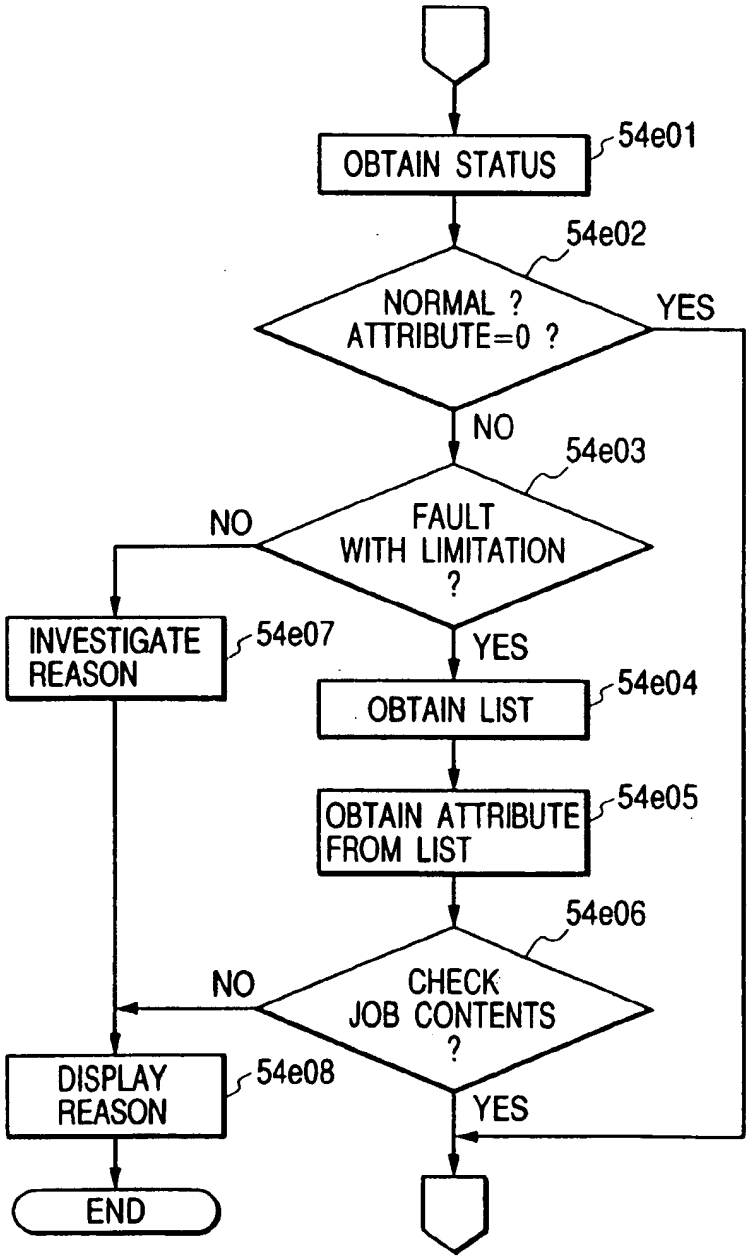


FIG. 91

USEUR INFORMATION CHECK PROCESS PRIOR TO JOB ISSUE

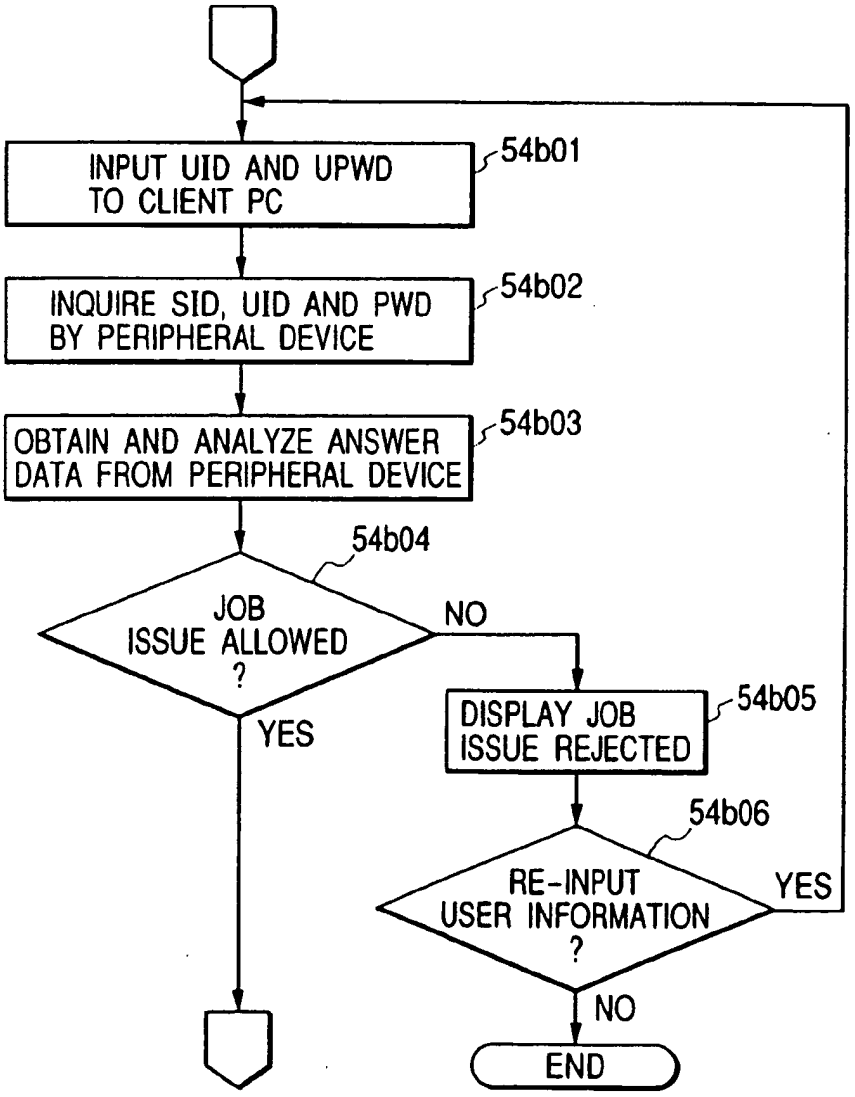


FIG. 92

DATA TRANSMISSION METHOD DETERMINING PROCESS

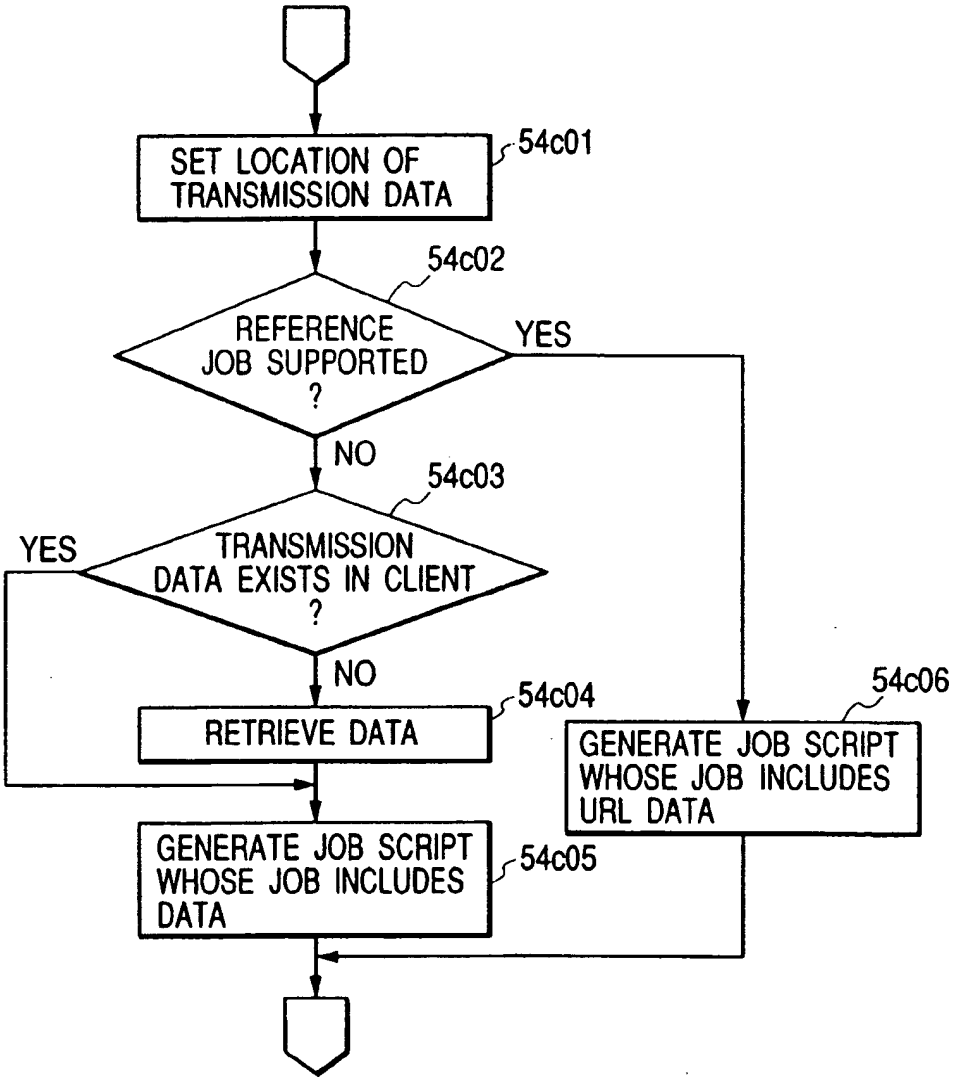


FIG. 93

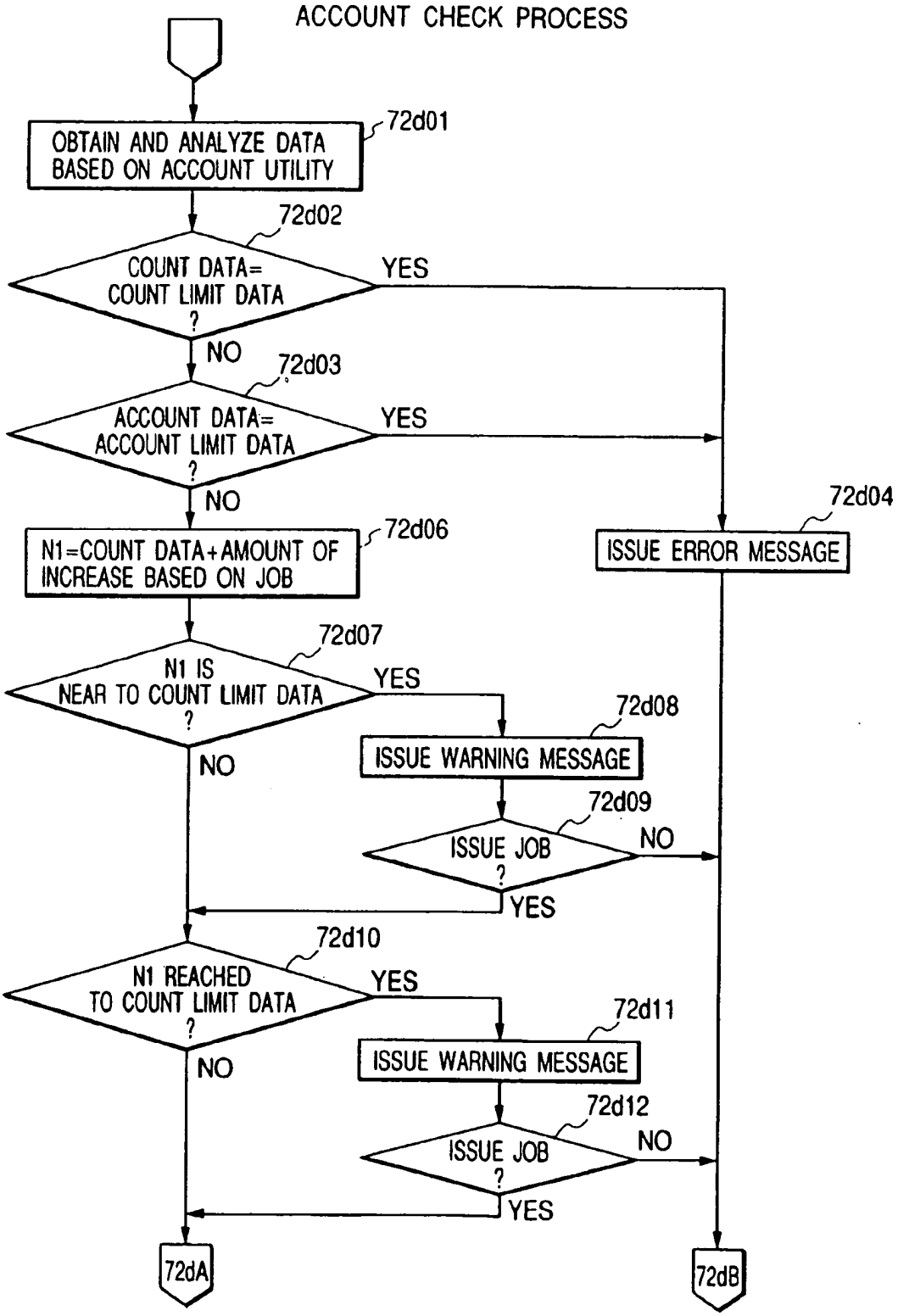

ACCOUNT CHECK PROCESS
OBTAIN AND ANALYZE DATA BASED ON ACCOUNT UTILITY
72d01
COUNT DATA= COUNT LIMIT DATA ?
72d02
YES
NO
ACCOUNT DATA= ACCOUNT LIMIT DATA ?
72d03
YES
NO
N1=COUNT DATA+AMOUNT OF INCREASE BASED ON JOB
72d06
ISSUE ERROR MESSAGE
72d04
N1 IS NEAR TO COUNT LIMIT DATA ?
72d07
YES
NO
ISSUE WARNING MESSAGE
72d08
ISSUE JOB ?
72d09
NO
YES
N1 REACHED TO COUNT LIMIT DATA ?
72d10
YES
NO
ISSUE WARNING MESSAGE
72d11
ISSUE JOB ?
72d12
NO
YES
72dA
72dB

FIG. 94

ACCOUNT CHECK PROCESS

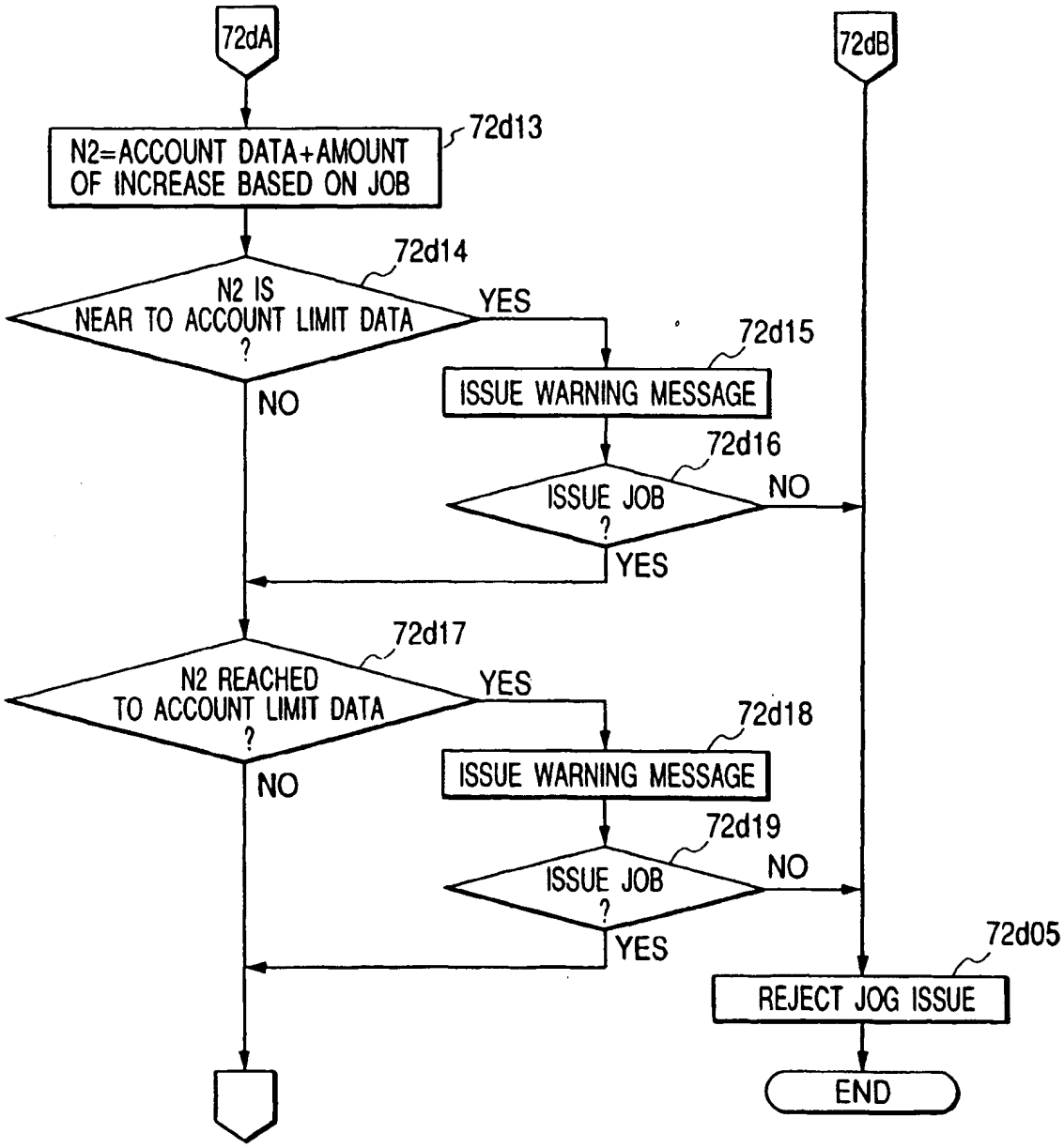


FIG. 95

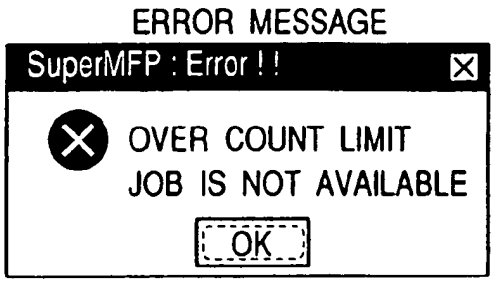


FIG. 96

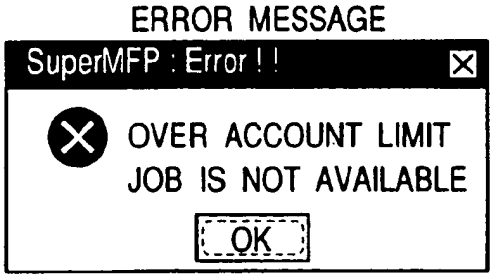


FIG. 97

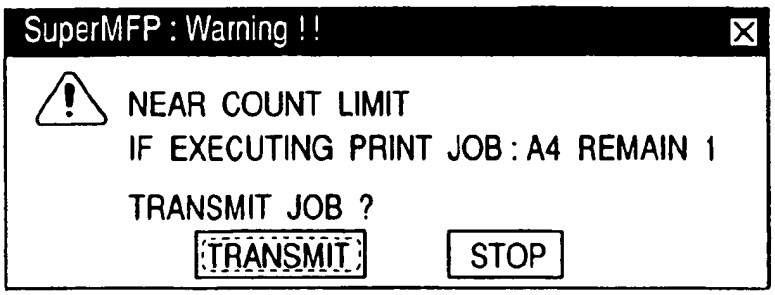


FIG. 98

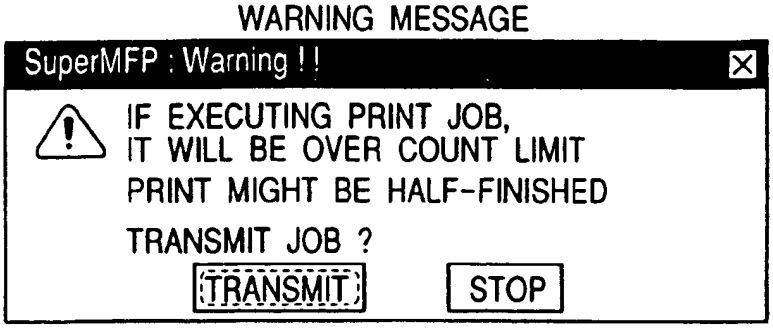


FIG. 99

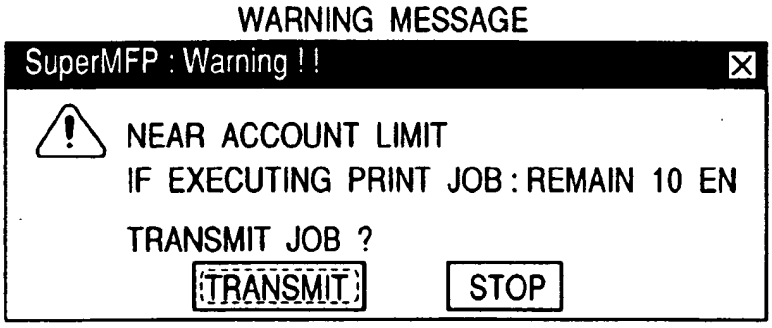


FIG. 100

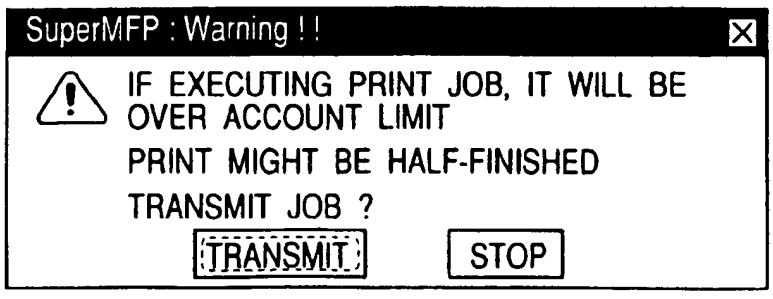


FIG. 101

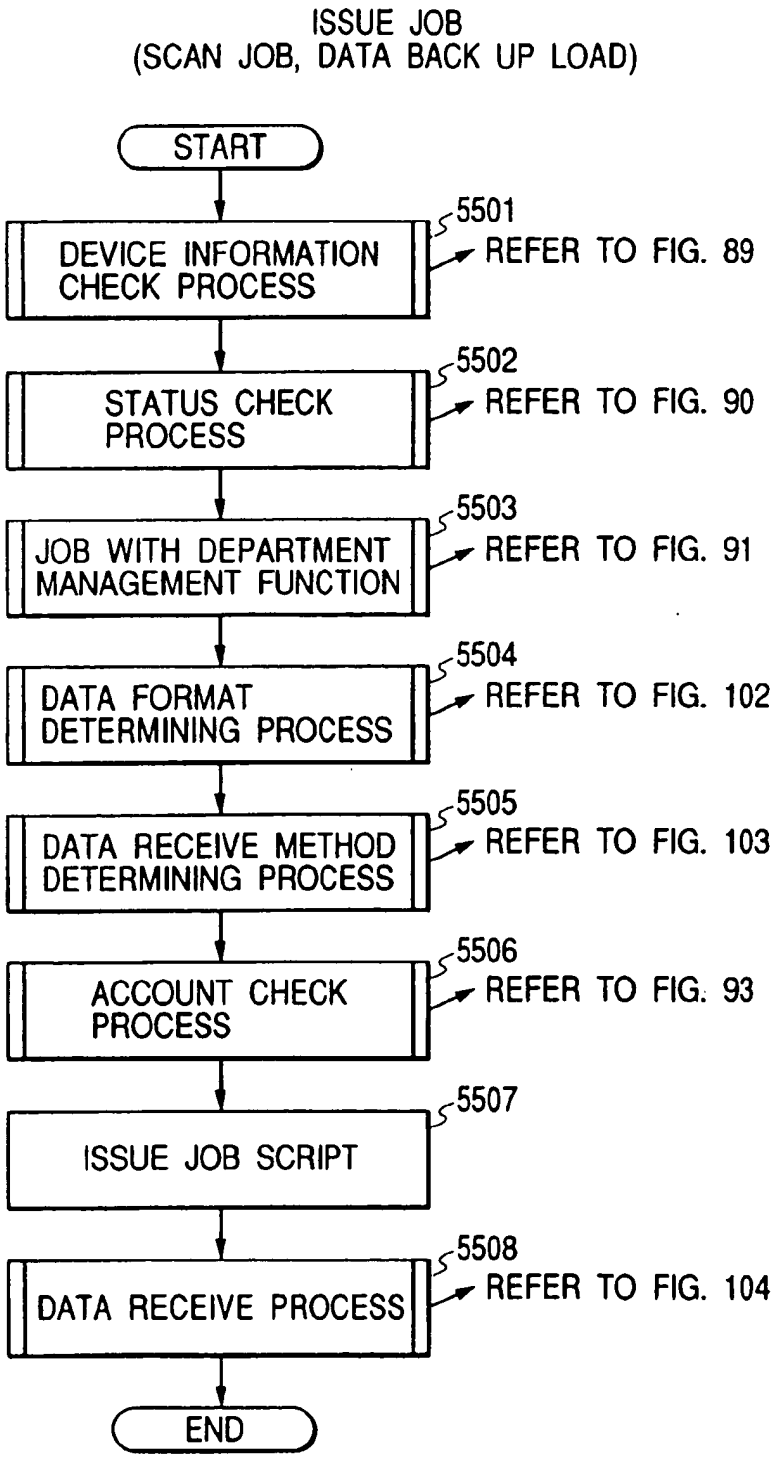

ISSUE JOB
(SCAN JOB, DATA BACK UP LOAD)
START
DEVICE INFORMATION CHECK PROCESS
5501
REFER TO FIG. 89
STATUS CHECK PROCESS
5502
REFER TO FIG. 90
JOB WITH DEPARTMENT MANAGEMENT FUNCTION
5503
REFER TO FIG. 91
DATA FORMAT DETERMINING PROCESS
5504
REFER TO FIG. 102
DATA RECEIVE METHOD DETERMINING PROCESS
5505
REFER TO FIG. 103
ACCOUNT CHECK PROCESS
5506
REFER TO FIG. 93
ISSUE JOB SCRIPT
5507
DATA RECEIVE PROCESS
5508
REFER TO FIG. 104
END

FIG. 102

DATA FORMAT DETERMINING PROCESS

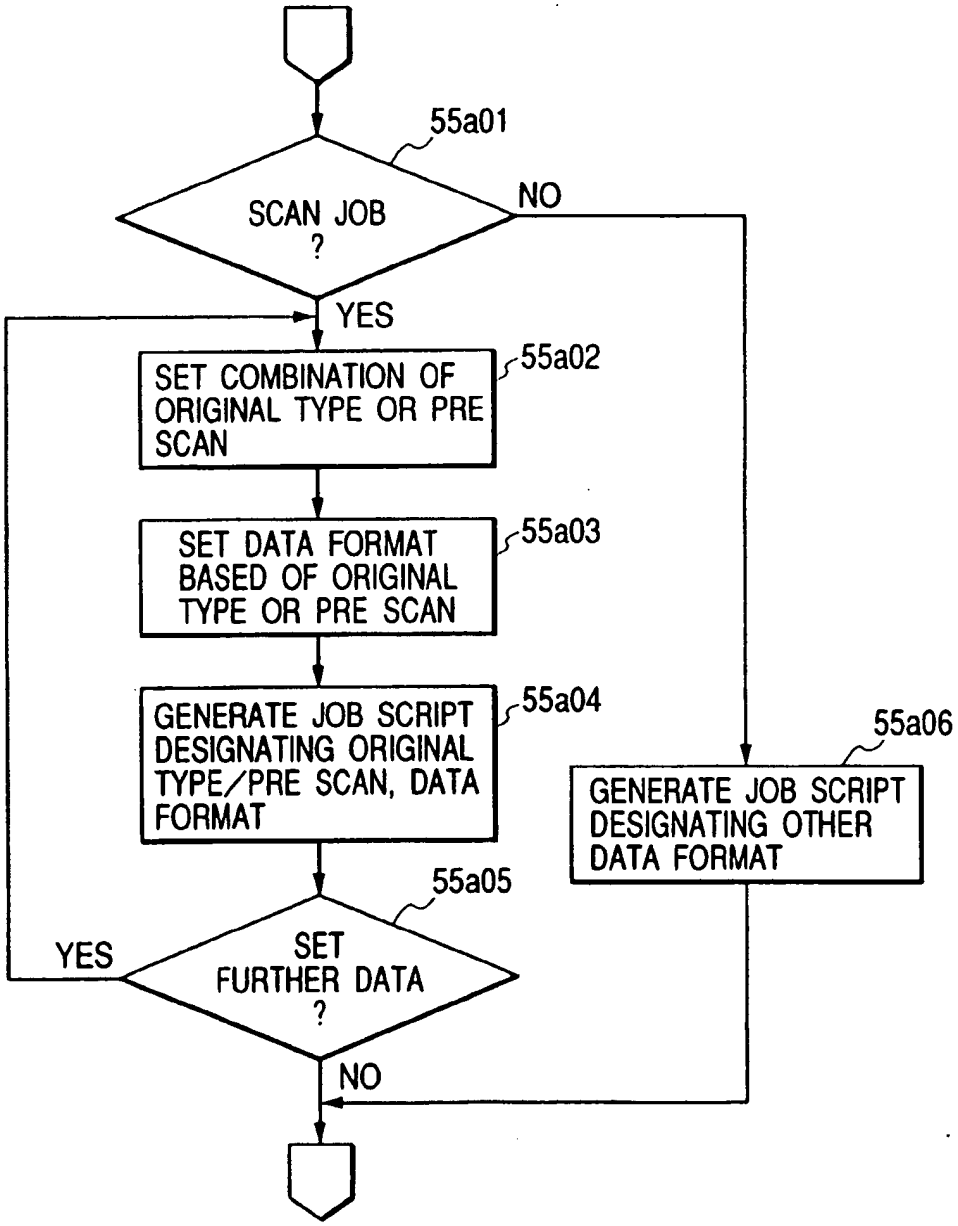


FIG. 103

DATA RECEIVE METHOD DETERMINING PROCESS

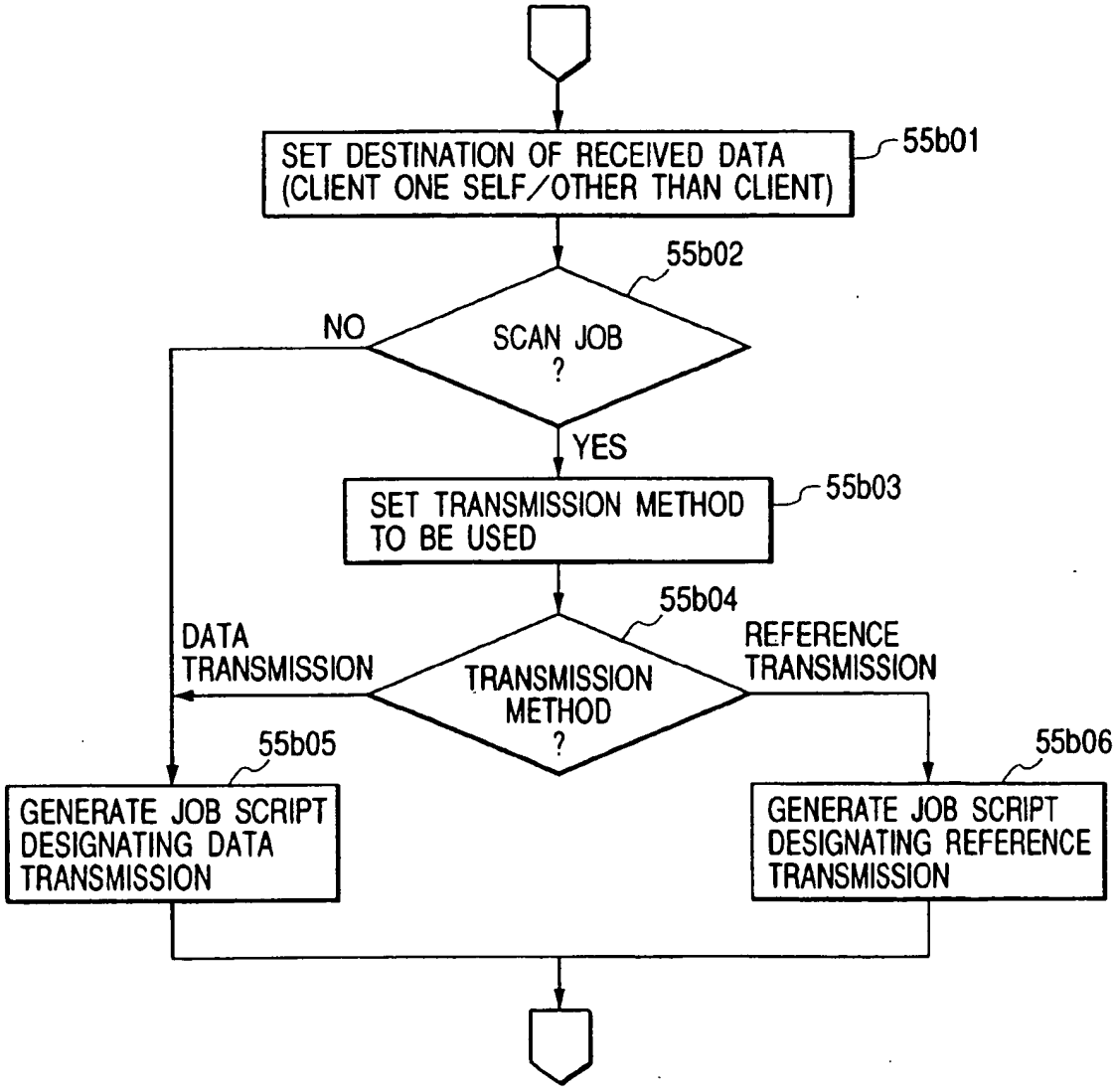


FIG. 104

DATA RECEIVE PROCESS

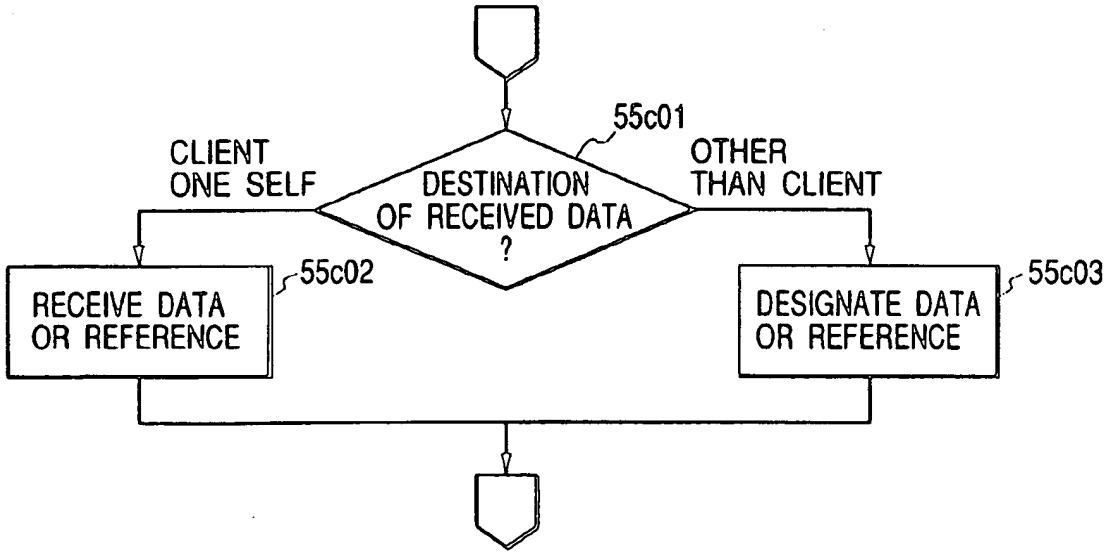


FIG. 105

ISSUE COPY JOB

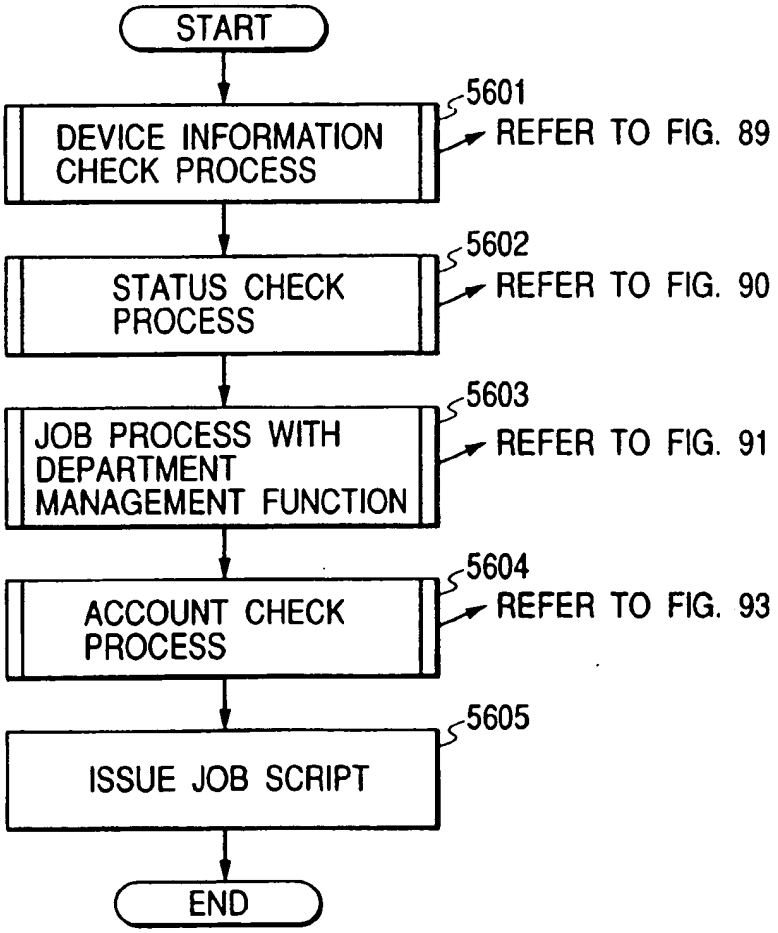


FIG. 106

ISSUE JOB COMMAND

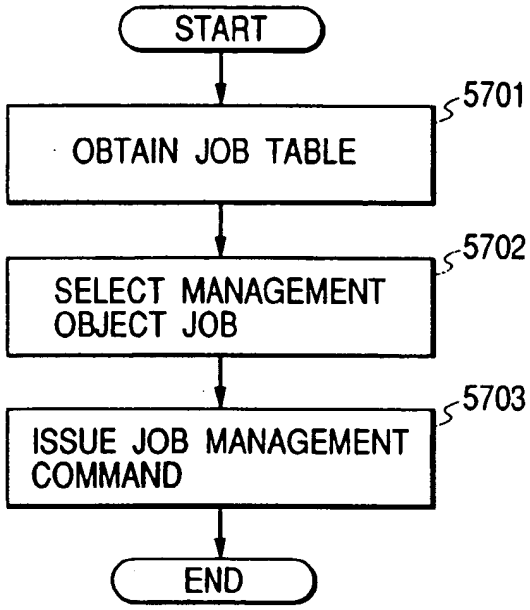


FIG. 107

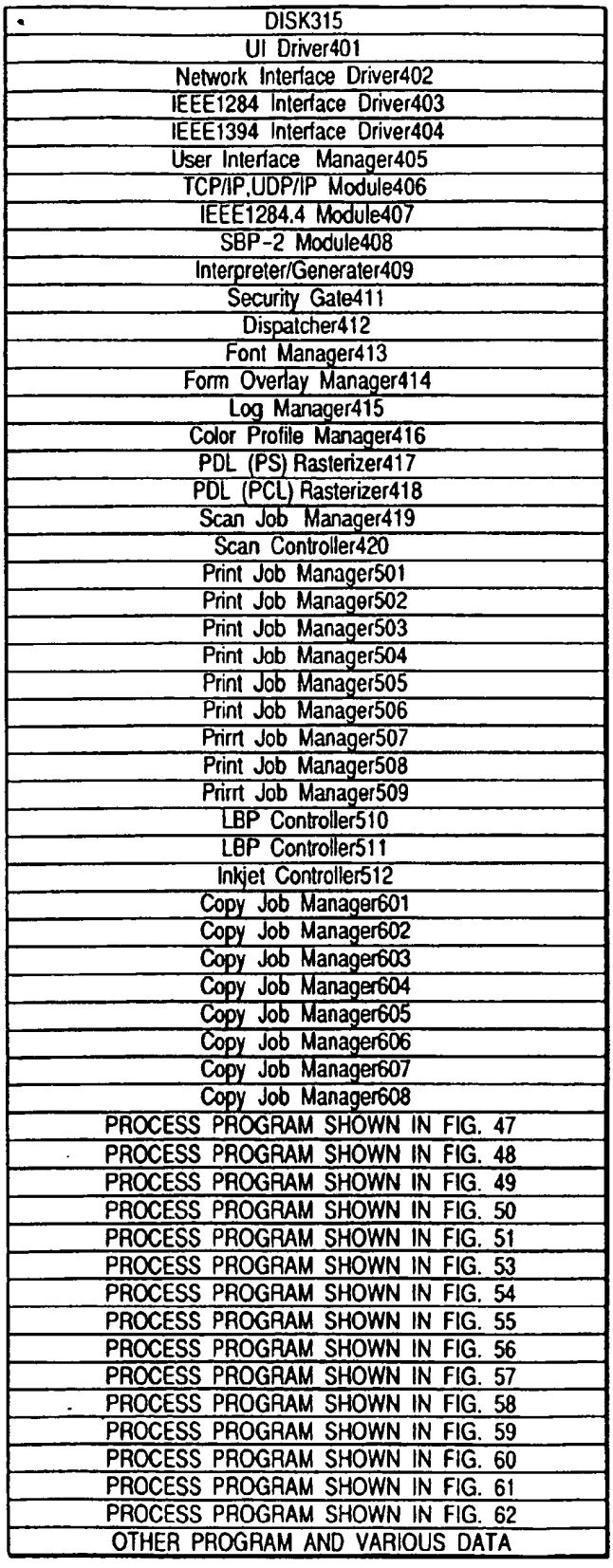

DISK315
UI Driver401
Network Interface Driver402
IEEE1284 Interface Driver403
IEEE1394 Interface Driver404
User Interface Manager405
TCP/IP,UDP/IP Module406
IEEE1284.4 Module407
SBP-2 Module408
Interpreter/Generater409
Security Gate411
Dispatcher412
Font Manager413
Form Overlay Manager414
Log Manager415
Color Profile Manager416
PDL (PS) Rasterizer417
PDL (PCL) Rasterizer418
Scan Job Manager419
Scan Controller420
Print Job Manager501
Print Job Manager502
Print Job Manager503
Print Job Manager504
Print Job Manager505
Print Job Manager506
Prirrt Job Manager507
Print Job Manager508
Prirrt Job Manager509
LBP Controller510
LBP Controller511
Inkjet Controller512
Copy Job Manager601
Copy Job Manager602
Copy Job Manager603
Copy Job Manager604
Copy Job Manager605
Copy Job Manager606
Copy Job Manager607
Copy Job Manager608
PROCESS PROGRAM SHOWN IN FIG. 47
PROCESS PROGRAM SHOWN IN FIG. 48
PROCESS PROGRAM SHOWN IN FIG. 49
PROCESS PROGRAM SHOWN IN FIG. 50
PROCESS PROGRAM SHOWN IN FIG. 51
PROCESS PROGRAM SHOWN IN FIG. 53
PROCESS PROGRAM SHOWN IN FIG. 54
PROCESS PROGRAM SHOWN IN FIG. 55
PROCESS PROGRAM SHOWN IN FIG. 56
PROCESS PROGRAM SHOWN IN FIG. 57
PROCESS PROGRAM SHOWN IN FIG. 58
PROCESS PROGRAM SHOWN IN FIG. 59
PROCESS PROGRAM SHOWN IN FIG. 60
PROCESS PROGRAM SHOWN IN FIG. 61
PROCESS PROGRAM SHOWN IN FIG. 62
OTHER PROGRAM AND VARIOUS DATA

FIG. 108

DISK6009
RULE INFORMATION DATABASE 504
DEVICE INFORMATION DATABASE 502
USER INTERFACE PROGRAM 501
DEVICE INFORMATION OBTAIN PROGRAM 503
Printer Driver505
Scanner Driver506
Copy Driver507
FONT MANAGEMENT UTILITY 508
FORM MANAGEMENT UTILITY 509
LOG MANAGEMENT UTILITY 510
COLOR PROFILE MANAGEMENT UTILITY 511
JOB MANAGEMENT UTILITY 512
DEVICE MANAGEMENT UTILITY 513
ACCOUNT MANAGEMENT UTILITY 514
Interpreter/Generater515
SBB-2 Module517
IEEE1394 Interface Driver518
TCP/IP, UDP/IP Module519
Network Interface Driver520
IEEE1284.4 Module521
IEEE1284.4Interface Driver522
PROGRAM SHOWN IN FIG. 65
PROGRAM SHOWN IN FIG. 66
PROGRAM SHOWN IN FIG. 67
PROGRAM SHOWN IN FIG. 69
PROGRAM SHOWN IN FIG. 70
PROGRAM SHOWN IN FIG. 71
PROGRAM SHOWN IN FIG. 72
PROGRAM SHOWN IN FIG. 73
PROGRAM SHOWN IN FIG. 74
PROGRAM SHOWN IN FIG. 75
Operation System
DOCUMENT EDIT PROGRAM
OTHER PROGRAM AND VARIOUS DATA

FIG. 109

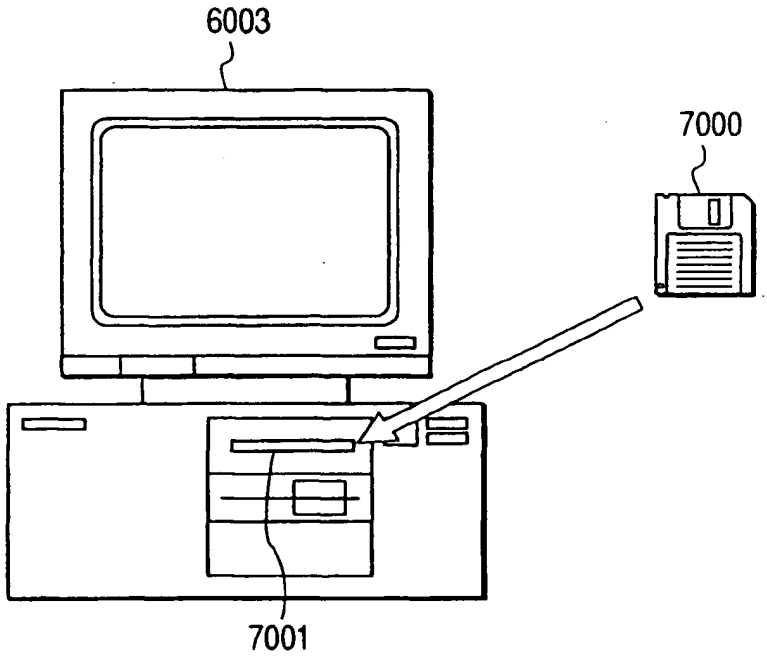


FIG. 110

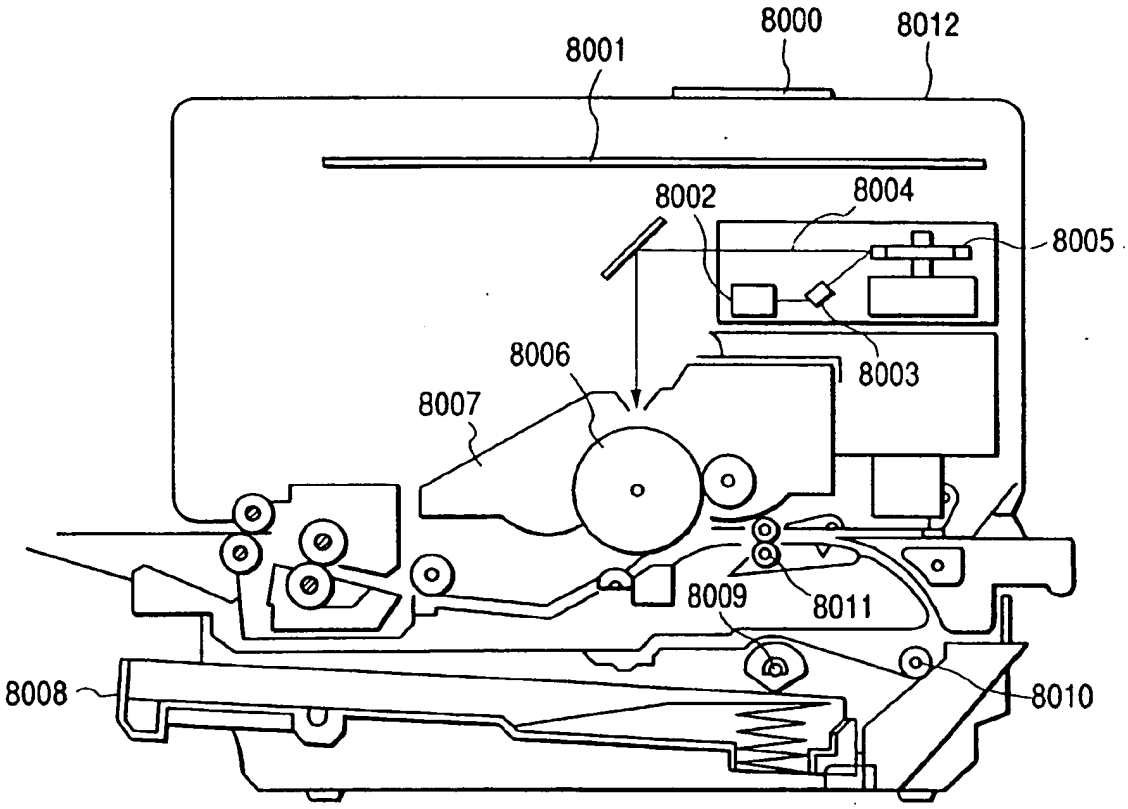

8000
8012
8001
8002
8004
8005
8003
8006
8007
8009
8011
8008
8010

FIG. 111

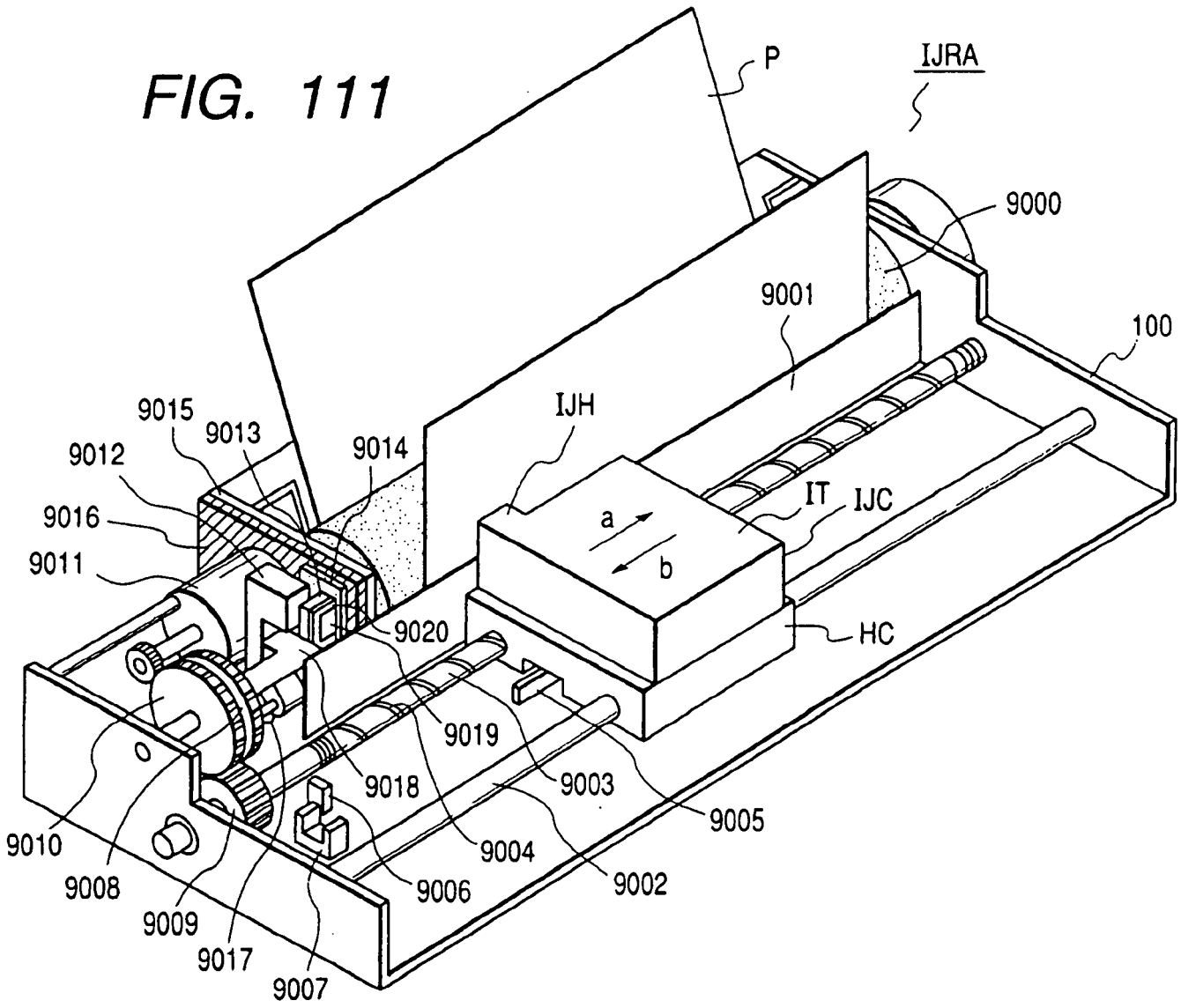

P
IJRA
9000
9001
100
IJH
9015
9013
9014
9012
9016
9011
IT
IJC
a
b
HC
9020
9019
9018
9003
9005
9010
9008
9009
9017
9007
9004
9006
9002

FIG. 112

PRINTER DRIVER A	
SUPPORTED PDL	: PDL1, PDL2
COLOR PRINT	: NOT AVAILABLE
SETTABLE MAX RESOLUTION	: 1200 dpi
SETTABLE MIN RESOLUTION	: 600 dpi

FIG. 113

PRINTER DRIVER B	
SUPPORTED PDL	: PDL3
COLOR PRINT	: AVAILABLE
SETTABLE MAX RESOLUTION	: 600 dpi
SETTABLE MIN RESOLUTION	: 300 dpi

FIG. 114

ACCOUNT ID

ACCOUNT ID (8301)	INCLUDED UID (8302)	CHARGE ALLOWED UID (8303)
2003	2355, 3254	1673, 6600
3992	4665	
4326		2355
2348	6600, 7789, 8895	3254, 4655, 2355

FIG. 115

CURRENT COUNT DATA TABLE

UID OR ACCOUNT ID (8401)	COUNTER (8402)
2003	45, 78, 34, 13
3992	33, 2, 4, 65
4326	0, 0, 0, 0
2348	10, 9, 33, 4

FIG. 116

COUNT DATA FORMAT TABLE

8501 UID OR ACCOUNT ID	8502 ATTRIBUTE ID
2003	565, 537, 545, 523
3992	565, 537, 545, 523
4326	565, 537, 545, 523
2348	565, 537, 545, 523

FIG. 117

COUNT LIMIT DATA TABLE

8601 UID OR ACCOUNT ID	8602 UID
2003	100, 100, 100, 200
3992	100, 10, 10, 100
4326	10, 10, 10, 10
2348	100, 100, 100,

FIG. 118

COUNT UNIT PRICE DATA TABLE

8701 UID OR ACCOUNT ID	8702 UNIT PRICE
2003	0.56, 0.78, 0.34, 0.55
3992	0.56, 0.80, 0.30, 0.50
4326	0.10, 0.20, 0.60, 0.10
2348	0.56, 0.78, 0.34, 0.55

FIG. 119

CURRENT ACCOUNT DATA TABLE

8801 UID OR ACCOUNT ID	8802 CURRENT ACCOUNT
2003	135.45
3992	53.78
4326	0.00
2348	26.04

FIG. 120

ACCOUNT LIMIT DATA TABLE

8901 UID OR ACCOUNT ID	8902 ACCOUNT LIMIT
2003	500.00
3992	300.0
4326	100.0
2348	500.00

FIG. 121

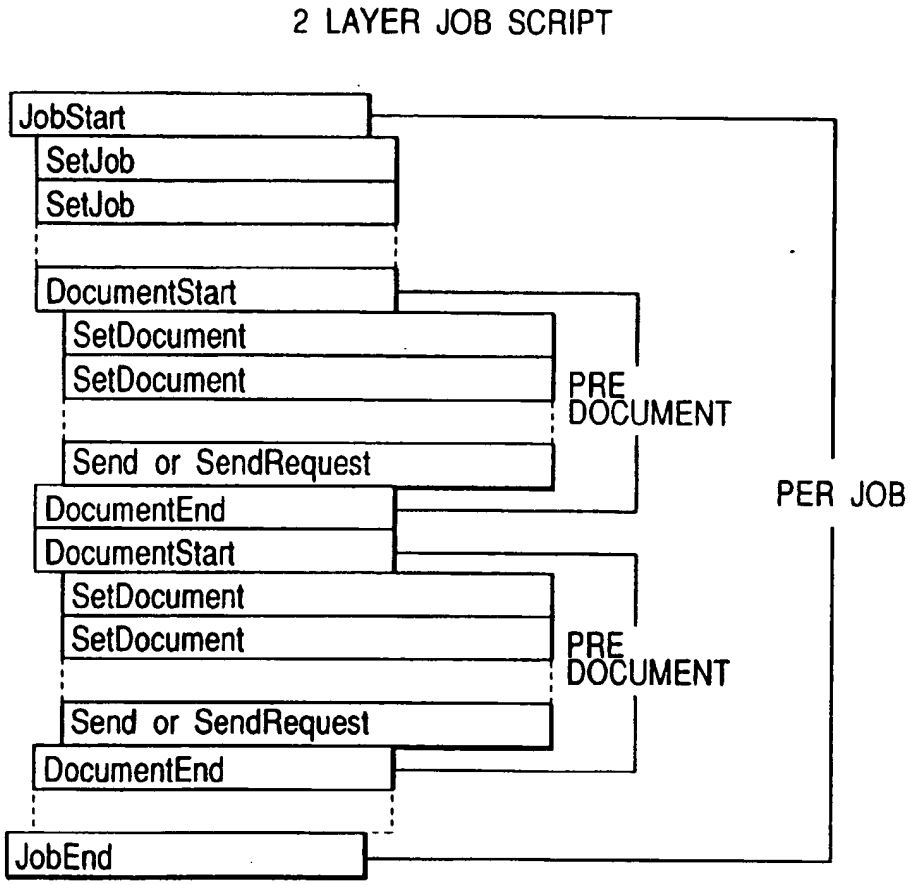

2 LAYER JOB SCRIPT
JobStart
SetJob
SetJob
DocumentStart
SetDocument
SetDocument
Send or SendRequest
DocumentEnd
DocumentStart
SetDocument
SetDocument
Send or SendRequest
DocumentEnd
JobEnd
PRE DOCUMENT
PRE DOCUMENT
PER JOB

FIG. 122

3 LAYER JOB SCRIPT

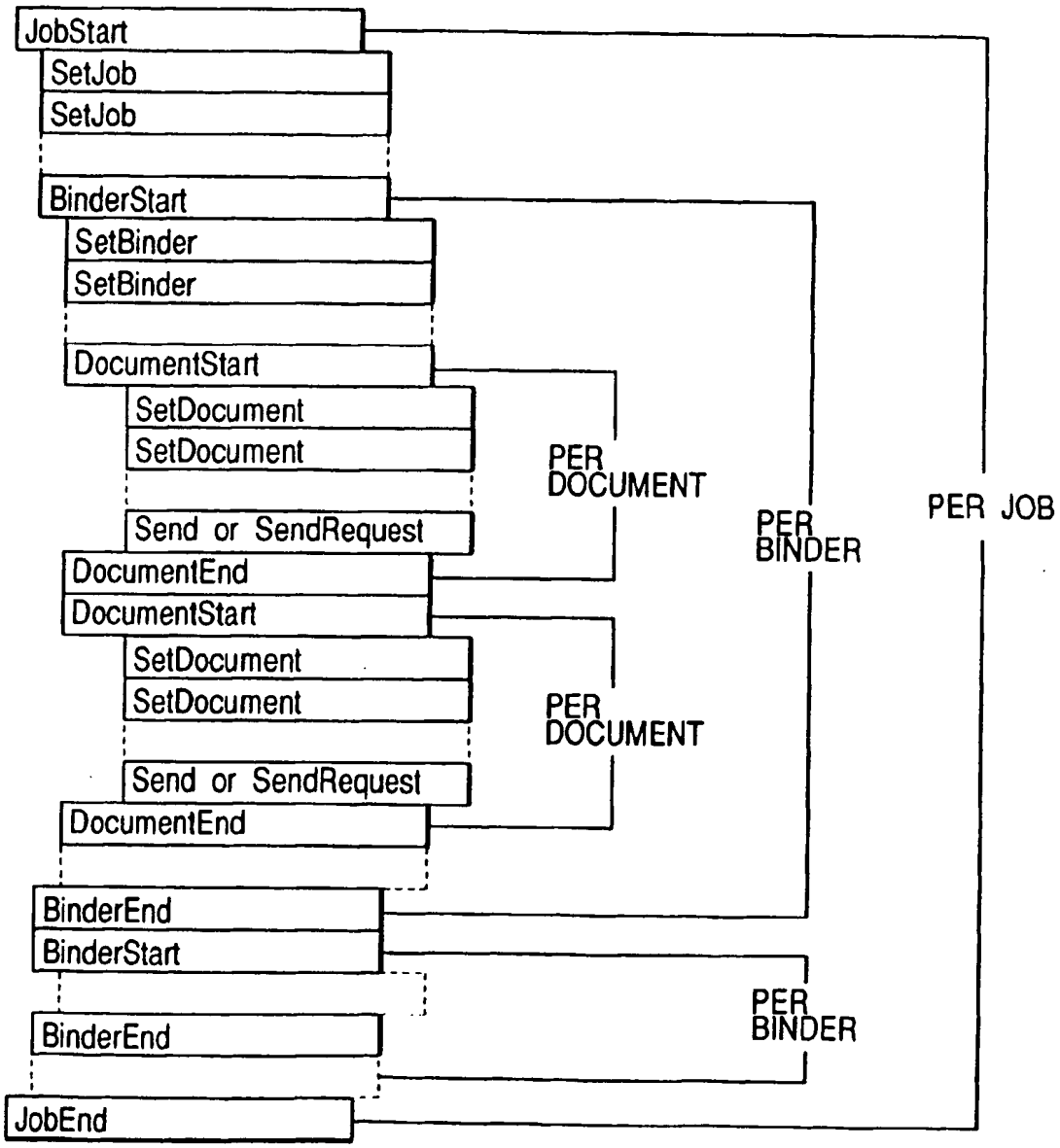
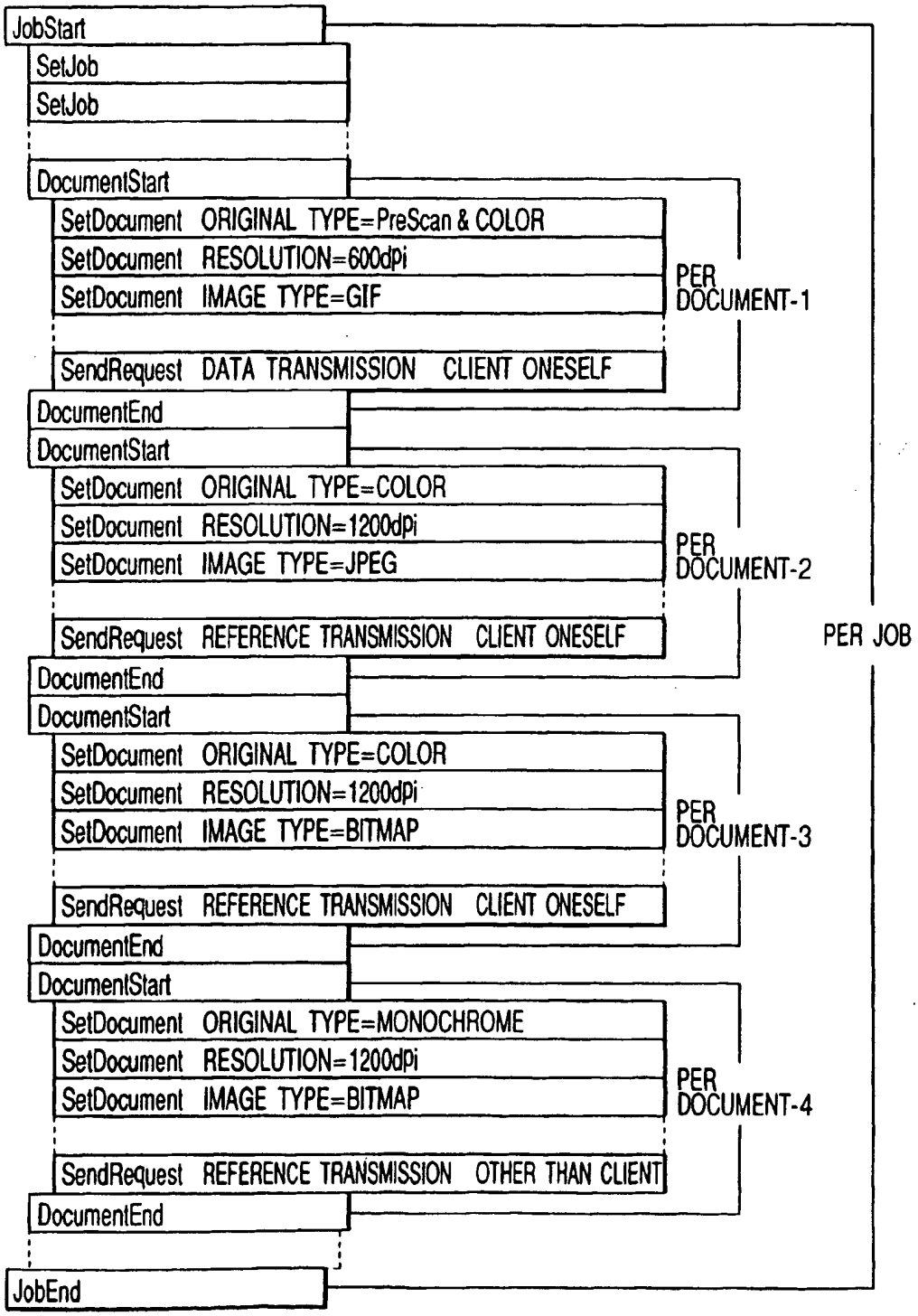


FIG. 123

EXAMPLE OF SCAN JOB SCRIPT